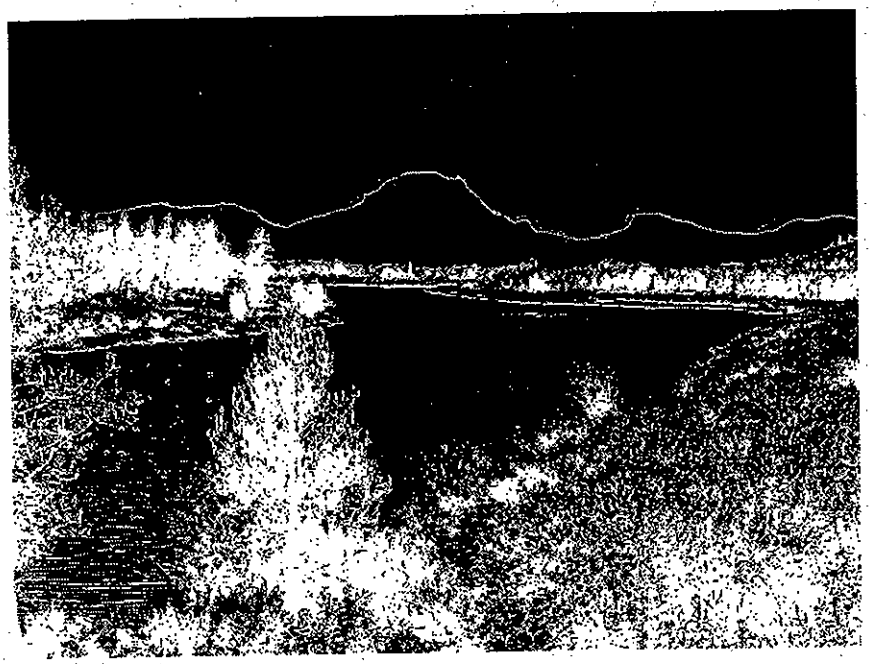
SNAKE RIVER MANAGEMENT PLAN

GRAND TETON NATIONAL PARK



October, 1997

FINDING OF NO SIGNIFICANT IMPACT
SNAKE RIVER MANAGEMENT PLAN
GRAND TETON NATIONAL PARK

In accordance with the provisions of the National Environmental Policy Act of 1969 and the regulations of the Council on Environmental Quality, 40 CFR 1508.9, the National Park Service prepared a Snake River Management Plan/Environmental Assessment (April 1997). The environmental assessment analyzed the impacts which would result from the proposed federal action of implementing the Snake River Management Plan. The Snake River Management Plan details specific actions to achieve the broad goals of providing for visitor use and resource protection as described in the Master Plan for Grand Teton National Park.

PROPOSED ACTION

Under the proposed action recreational use of the river corridor below the Jackson Lake Dam will be held at approximately current levels. Each individual scenic float operation will retain its current permitted daily launch quota, not to exceed a monthly cap. This monthly cap will be based on each concessionaire's highest month during the operating seasons of 1994, 1995 and 1996. The monthly overall cap for commercial scenic use will be 2,603 launches, which will include 39 reserve allotments. As with the monthly allotments, each company's reserve will be based on its highest monthly reserve use during the 1994, 1995 and 1996 seasons. Each company's reserve may be used to exceed its daily permitted launch quota; however, it will count towards the monthly cap since these number's were factored into the monthly use limit. In 1999, when the new commercial prospectuses are issued, each permitee who has not utilized its permit two out of the last three years will find its use subject to reallocation.

Each commercial fishing operator will be assigned a monthly cap, based on the concessionaire's highest month over the last three operating seasons. This will provide a monthly overall total of 526 commercial fishing launches, a potential average of 17 launches/day. Those outfitters with little or no use over the last three seasons will be assigned a monthly cap based on the lowest of all current fishing outfitters. Each guide service will be limited to six launches per day. If the standard of 20 launches per day is exceeded more than 5 days a month, a more restrictive daily cap will be explored. In order to spread use out from the crowded river sections, the following incentive will be provided to float the Moose/Wilson section. On this section, fishing guides will be allowed to float 3 launches per day that will be applied to their daily cap, but not to their monthly cap. The goal, as in the upriver sections, will be to have not more than 20 launches per day on the Moose/Wilson section. If this is exceeded more than 5 days a month, than a more restrictive cap will be explored. In 1999, when the new commercial prospectuses are issued, those permitees who have not utilized their permits two out of the last three years, will find their permitted use subject to reallocation.

Commercial rafts will be limited to crafts which are rated to carry 17 passengers or less, with the exception of the Jackson Lake Lodge big boats which are rated to carry 24 passengers.

If noncommercial use exceeds standards outlined in chapter 5 of the plan, the number of private boaters allowed on the river per day will be limited through the implementation of a permit system. If use levels do not significantly increase, no restrictions are anticipated.

The NPS will conduct minor dredging at the launch sites. An individual 404 permit will be obtained from the U.S. Army Corps of Engineers prior to any work being conducted.

Minor changes to improve parking and circulation will be conducted at Jackson Lake Dam, Cattlemans Bridge, and Schwabackers landing. Restroom facilities will be added to existing facilities at Pacific Creek Landing and Deadmans Bar. Bank stabilization will occur at Pacific Creek landing to protect the launch from further erosion.

ALTERNATIVES CONSIDERED

Three reasonable alternatives to the proposed action were analyzed in the environmental assessment: No Action, Increased Use and Experience by Segment. The No Action alternative left commercial use at its current permitted levels. That would provide a potential increase of 48% on average 1996 levels for commercial floating and no upper limits for commercial fishing or private floating. In addition, no dredging in excess of 25 cubic yards would be conducted at the launch sites and no improvements in parking or circulation would be made. The increased use alternative proposed an increase of 10% over existing scenic float permits, or a potential increase of 64% over average 1996 levels. It also proposed capping guiding fishing at a level 10% above average 1996 levels. The Experience By Segment alternative proposed to zone the river by section and provide different levels of use per segment. Both the Increased Use and Experience By Segment proposed to treat the launch areas the same as the preferred alternative.

The environmental assessment analyzed anticipated short-term, long-term, and cumulative impacts which would result from implementation of the proposed action and each alternative in conjunction with past activities, current conditions, and possible future actions.

PUBLIC INVOLVEMENT

From the outset of the planning process, public input played a critical role in determining the problems and opportunities that would be addressed by the plan. Three public workshops have been held during November 1994, June 1994, and March 1995. In addition two open houses were held for float and fishing trip permit holders in October 1995 and 1996 to hear some of their comments and suggestions about river regulations, manipulation and commercial use. An additional meeting was held in conjunction with the U.S. Forest Service in February 1997 to discuss possible options for managing commercial fishing.

A Draft Snake River Management Plan was released for public review for a 60 day period from August 13 through October 15, 1996. A second Snake River Management

Plan/Environmental Assessment was released for a 45 day public review in April 1997, ending on June 2, 1997. A total of 28 comments were received, and those comments are incorporated throughout the plan.

REGULATORY REVIEW

The National Park Service provided the Wyoming State Historic Preservation Officer (SHPO) documentation in support of a finding of no effect on historic properties in the area of potential effects in accordance with 36 CFI Part 800 regulations for implementation of Sec. 106 of the National Historic Preservation Act.

FINDING

Approval of alternative 1 in the environmental assessment is preferred for the following reasons:

1. There would be no significant impact to natural resources or cultural resources as analyzed in the environmental assessment.

2. There would be no adverse impacts to floodplains or wetlands, as evaluated under Executive Order 11988, Floodplain Management, and Executive order 11990, Protection of Wetlands.

3.. There would be no significant impacts which would jeopardize the continued existence of threatened or endangered plant or animal species, in accordance with Section 7(c) of the Endangered Species Act.

4. There would be no adverse impact, to sites or districts listed or eligible for listing in the National Register of Historic Places under the procedures of Sec.106 of the National Historic Preservation Act.

6. No highly uncertain or controversial effects, unique or uncertain risks, significant cumulative impacts, or elements of precedence have been identified.

7. There would be beneficial use of the environment without degradation, resulting in benefit to public health and safety and advancement of the approved management goals of the National Park Unit.

After thorough review and consideration of the information contained in the environmental assessment and the public comments, I find that the proposed action does not constitute a major federal action significantly affecting the quality of the human environment as defined in 40 CFR 1508.27. In accordance with the National Environmental Policy Act of 1969, as

amended, and the regulations of the Council on Environmental Quality (40 CFR 1508.9), an environmental impact statement will not be prepared for this federal action.

Jack Neckels
Superintendent

10/6/97
Date

SNAKE RIVER MANAGEMENT PLAN

GRAND TETON NATIONAL PARK

October, 1997

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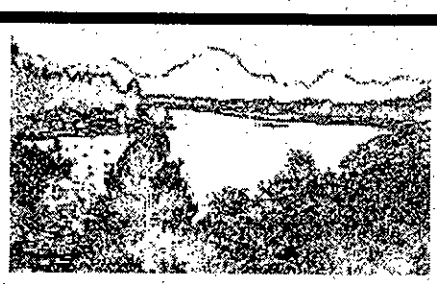
EXECUTIVE SUMMARY



"(The Snake River) has no North American rival combining wildlife and mountain scenery... Riverfront views of the Tetons are perhaps the most classic mountain scene in North America, photographed by millions... The river is both a mirror and window to the rest of the west."

Tim Palmer, Window to the West

EXECUTIVE SUMMARY

This plan sets forth the management philosophy for the Snake River Corridor and provides strategies for addressing issues and objectives based on that philosophy. This picturesque river originates in the highlands of northwestern Wyoming's Teton Wilderness Area, flows west through a portion of Yellowstone National Park, south through John D. Rockefeller, Jr. Memorial Parkway and then enters Grand Teton National Park as it flows into Jackson Lake. This plan addresses the 25 mile section of the river that flows east from the Jackson Lake Dam, then south to the park's boundary.

Cultural resources within the corridor are briefly discussed, but will be more fully addressed in the park's upcoming Cultural Resources Management Plan.

PROJECT SCOPE AND OBJECTIVES

The National Park Service determined that an updated Snake River Management Plan was needed not only to resolve present issues, but to ensure wise choices for future management and use of the river corridor.

This Snake River Management Plan builds upon the goals set forth in the Grand Teton National Park Master Plan and Statement for Management which are discussed in Part One. Once finalized, it will guide National Park Service stewardship of the river corridor. The plan has been designed to achieve the following objectives:

- Identify the biological, cultural and scenic values that define the unique character of the Snake River Corridor.
- Identify key issues to be resolved in this plan.
- Formulate a management framework that responds to the issues and effectively guides National Park Service management of the river corridor.
- Determine the appropriate carrying capacities for visitor use of the river corridor.
- Present alternatives for visitor use of the river corridor.
- Develop a resource monitoring and implementation schedule for the completed plan.

PLANNING ISSUES

From the outset of the planning process, public input played a critical role in determining the problems and opportunities that would be addresed by the plan. To date, three public workshops have been held, during November 1994, June 1994, and March 1995. In addition, two open houses were held for float and fishing trip permit holders in October 1995 and 1996 to hear some of their comments and suggestions about river regulations, manipulation and commercial use. An additional meeting was held in conjunction with the U.S. Forest Service in February 1997 to discuss possible options for managing commercial fishing.

A Draft Snake River Management Plan was released for public review for a 60 day period from August 13 through October 15, 1996. A second Snake River Managment Plan/Environmental Assessment was released for a 45 day public review in April 1997, ending on June 2, 1997. A total of 28 comments were received, and those comments are incorporated throughout this plan.

Resource Protection and Enhancement

Public opinion emphasized the desire to maintain the river's natural character in order to protect wildlife and scenic quality. Wildlife issues such as eagle nest closures and temporary habitat closures for other species need to be explored. Decline in cottonwood seed regeneration in riparian areas should be explored in light of dam openings and closures.

Access

Current boat launch areas become crowded during the summer months, with boaters waiting in line to launch or exit the river. At some access points, gravel builds up and impedes launch use. The number and location of launch sites need to be reviewed and alterations to the landings evaluated: should there be slip clearance or dredging, alternate locations as the river character changes, or permanent vs. temporary landings designated?

Parking at some launch areas comes congested and is not well defined. At times, the vault toilets at Deadmans Bar and Pacific Creek have long lines. What level of development is appropriate at the launch areas that will not further impact the riverine environment?

Commercial and Private River Use

The perception exists that the river may become overcrowded in the future. This perception ties in with the often misunderstood concept of carrying capacity.

Carrying capacity means the amount and type of recreational use an area can accommodate without altering either the environment or the user's experience beyond the degree of change deemed acceptable by the management objectives for the area.

If use of the Snake River continues to advance at the current rate, there will be increased stress on aesthetic and

wildlife resources. This stress will be caused by the growing number of largely unregulated non-commercial and guided fishing boats and increased use of commercial scenic launches.

What is now needed is a reevaluation of carrying capacities for the Snake River, based on scientific recommendations. This reevaluation will then establish updated management objectives for the river, to determine acceptable upper limits of use. In addition to developing new carrying capacities, methods for staying within these limits need to be generated and explored.

THE GOALS OF THE SNAKE RIVER MANAGEMENT PLAN

The basic goals of Grand Teton National Park in the management of the Snake River reflect those of the NPS as expressed in the National Park Service Act of 1916 and the Redwoods Act of 1978. The main objective is to *"...conserve the scenery and natural and historic objects and wildlife therein and to provide for the enjoyment of the same [and] leave them unimpaired...."* These legislative mandates are the driving force behind management decisions effecting NPS areas across the nation. The mandates which apply to this project are:

- To preserve the natural resources and environmental processes of the Snake River corridor and the associated riparian and river environments. To protect the Snake River and its riparian environment from unacceptable change caused by human activities.

- To protect and preserve the historic resources in the river corridor and associated environments.

- To provide Snake River users the opportunity to participate in and appreciate a variety of unique experiences offered by Grand Teton National Park as a whole and by the riverine environment in particular. To provide an opportunity for all participants to enjoy a rewarding river running experience.

- To provide a quality Snake River experience through Grand Teton National Park:

- By determining the impact of crowding and use levels on visitor experience.

- By then establishing a human use capacity and a limitation on use that protects the river's natural resources and processes.

- To provide opportunities for people of various ages and abilities to participate in river trips.

Management Plan

The National Park Service developed this final Snake River Management Plan as a result of comments and input received on the Draft Snake River Management Plan released in August of 1996, and the Snake River Management Plan/Environmental Assessment released in April 1997. This Snake River Management Plan is scheduled to begin implementation during the summer of 1999.

Public comment throughout this planning process generally reflected a desire to see future use levels on the river remain consistent with existing levels.

After release of the Draft Snake River Plan in August of 1996, many of the commercial outfitters asked that a simple average of use not be applied to determine launch numbers, since use varies widely depending on user demand, weather, and time of the week, as well as time of the season. In response to that request, the preferred alternative presented in the Snake River Management Plan/Environmental Assessment in April 1997 proposed to cap use at existing levels, with commercial float and fishing use caps set in a way that provide some flexibility for fluctuating demand. Several comments received on the April 1997 draft felt that the system proposed of daily caps in addition to monthly caps was going to be difficult to manage. Several other comments from commercial operators requested that the current reserve allotment system remain in effect. Other comments reflected the desire to see the no-action alternative implemented, no parking restrictions at launch areas and improvements to the launch areas developed. Some commercial outfitters felt that they were regulated enough and that private users should be regulated more stringently.

Several public comments were made requesting additional opportunities for commercial guided fishing on Jackson Lake. Grand Teton Lodge Company and Signal Mountain Lodge currently hold permits to offer guided fishing on Jackson Lake. The Lodge Company has the contractual right to provide any additional fishing services on the park's lakes, if the park were to authorize them.

In addition, several public comments were made requesting additional commercial fishing use of the Moose to Wilson section, which flows within park boundaries for the first three miles. The Bureau of Land Management owns the Wilson launch and take-out site. This section is open to all commercial fishing outfits currently permitted by the park. Grand Teton National Park administers all commercial activity which takes place within the park, even if those activities extend beyond its boundaries. The park will continue to authorize permits for commercial use of the Snake River from Moose to the park boundary. When the Bureau of Land Management undertakes a management plan for land it administers along the river downstream of the park, the National Park Service will work with the BLM as appropriate during their planning process.

Recreational Use

Commercial use of the riparian areas would continue, with the following provisions:

Scenic Floating

Each individual scenic float operation will retain its current permitted daily launch quota, not to exceed a monthly cap. This monthly cap will be based on each concessionaire's highest month over the 1994, 1995 and 1996 operating seasons.

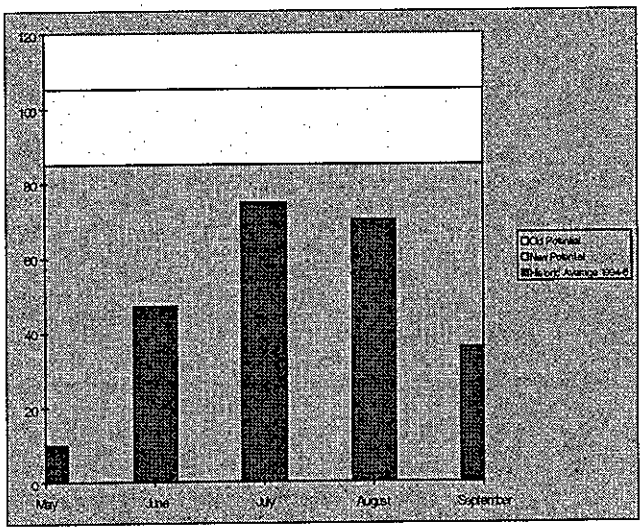
By utilizing each concessionaire's historic high month, current use of reserve allotments will be factored into the monthly use limit.

However, in order to give the concessionaire's additional flexibility to address unusual high use days, the reserve allotment system will remain, based on the following system. Historic use of reserve allotments over the last three operating seasons will be factored into individual permits. As with the monthly allotments, each company's reserve will be based on its highest monthly reserve use. Each company's reserve may be used to exceed its daily permitted launch quota; however, it will count towards the month cap since these number's were factored into the monthly use limit.

Individual permits will be assigned through the concessions program; individual launch numbers will be allocated through the concessions operating plan for each individual outfitter. The intent is to give each concessionaire some flexibility to take into account weather and client patterns. Each current permittee with no use will retain its daily allotment, and its monthly cap will be based on the lowest of all float trip operators. In 1999, when the new commercial prospectuses are issued, each permitee who has not utilized its permit two out of the last three years will find its use subject to reallocation.

The monthly overall cap for commercial scenic use will be 2,603 launches, which will include 39 reserve allotments. This provides a potential average of 84 launches per day, but in reality, all days are not amenable to the same degree of river use. Therefore, total daily scenic launches permitted would remain at 103 per day, more than the average, to allow flexibility for fluctuations in weather, water, clients numbers, etc. This limit on the commercial outfitters will reduce current permitted levels by approximately 23%, but current use levels will easily be accommodated. This is a 10% increase over July 1996 levels. **In other words, existing use will not be reduced, but the potential for significant growth has been eliminated.**

For example: If a concessionaire has a monthly not to exceed (NTE) of 500 launches, with a daily NTE of 20, he may launch an average of about 16 boats a day. Actual weather and customer patterns suggest that use will vary, and he may launch up to 20 boats a day as long as at the end of the month he has not exceeded 500 launches.



The above graph shows the historical average use in relation to both the old limits and the new proposal. Previously, limits were only in effect from June 10 through Sept. 15. This plan proposes that limits be in effect year round.

Guided Fishing

In commercial guided fishing, as in scenic floating, **the intent is to easily accommodate current levels of use, but eliminate the potential for significant growth.** Guided fishing launches over the last three seasons have averaged 13/ day, never exceeding 19 launches/day. The goal is to have no more than 20 guided fishing launches on any given day between Jackson Lake Dam and Moose.

Each fishing outfitter will be assigned a monthly cap, based on its highest month over the 1994, 1995 and 1996 operating seasons. Those fishing outfitters with little use over the last three seasons will be assigned a monthly cap based on the lowest of all current fishing outfitters. This will provide a monthly overall total of 526 commercial fishing launches, a potential average of 17 launches/day. As in scenic float operations, all days are not amenable to the same degree of fishing use, and we anticipate that actual use will fluctuate. In 1999, when the new commercial prospectuses are issued, those permitees who have not utilized their permits two out of the last three years, will find their permitted use subject to reallocation.

Each guide service will be limited to six launches per day. As in the current concessions operating plan, guided fishing operations will phone in their use numbers and locations to park dispatch each morning. Dispatch will provide the locations of other guides, so that fishing operations can spread themselves out voluntarily through the other sections. If the standard of 20 launches per day is exceeded more than 5 days a month, a more restrictive daily cap will also be placed on each outfit.

In order to spread use out from the crowded river sections, the following incentive will be provided to float the Moose/Wilson section. On this section, fishing guides will be allowed to float 3 launches per day that will be applied to their daily cap, but not to their monthly cap. The goal, as in the upriver sections, will be to have no more than 20 launches per day on the Moose/Wilson section. If this is exceeded more than 5 days a month, than a more restrictive cap will be explored.

Current rules applicable to guided fishing and float trips concerning designated launching, landing and lunch stop sites will continue. Stopping commercial scenic boats other than at designated locations along the river will be prohibited. Other administrative or operational requirements to remain in effect include monthly reporting of operations, boatman qualifications, equipment standards, provision of an interpretive program to the public, safety requirements and Park Service approval of prices. These will continue to be addressed and modified, if necessary, through annual concession operating plans.

Existing picnic sites will continue to be available to both private users and designated commercial users, if conditions permit and no new resource implications arise. No special maintenance will be conducted, such as grading roads to keep these sites open to vehicles.

Commercial boats will continue to wait to launch until others are out of sight; this regulation has been in effect for some time. If excessive crowding becomes an issue, on the ramps or on the river, designated launch times may be instituted.

Commercial rafts will be limited to craft's which are rated to carry 17 passengers or

less, with the exception of Jackson Lake Lodge's big boats, which are rated to carry up to 24 passengers.

In 1999 when the commercial prospectuses are issued, the number of rafts per group may be further limited and certain shuttle frequencies may be required.

The following passenger meeting points will be designated: Moose, Pacific Creek, and concession operated sites. However, commercial operators will be encouraged to meet clients at their own facilities. If crowding at parking areas becomes a problem in the future, commercial operators may be required to meet clients off site.

The launch site at Triangle X will continue to be utilized by the ranch.

Private Floating

Non-commercial use will continue with the following provisions:

A monitoring system was developed and began the summer of 1997 to obtain accurate counts of private users. If non-commercial use exceeds standards outlined in chapter 5, the number of private boaters allowed on the river per day will be limited through the implementation of a permit system. If use levels do not significantly increase, no restrictions are anticipated.

Launch Areas

The NPS will conduct minor dredging at launch sites. Gravel removal will be conducted to provide reasonable access to the visitor when necessary. Dredging will be conducted only in the immediate vicinity of the launch areas, and only when deemed necessary by park managers.

Discussions of the launch areas are conceptual in this plan. Site specific design work will be completed prior to construction.

Jackson Lake Dam

The NPS will adopt the conceptual design developed during the 1980s, when the Jackson Lake Dam was reconstructed. At that time, the area now used for parking and boat launching was the construction staging area. A schematic site plan was developed to rehabilitate much of the disturbed area while providing access to the river. The plan's intent is still valid. Pedestrian access to the river will be provided for a variety of uses including fishing, walking, picnicking or just sitting and enjoying the environment. Parking for vehicles will be provided just north of the river, in an area which has trees for shade and provides some separation from the river bank. A walkway will be built to provide easy access from the parking lot to the river. In addition, access, but no developed slip, will be provided for the loading and unloading of small boats. Limited handicapped parking will be provided as well.

Cattlemans Bridge

A survey and evaluation will be initiated to determine the historic significance of the bridge prior to any action taken in this area. Depending on the outcome of that survey, the following is proposed:

Launch/Parking: This plan proposes to maintain the primitive environment at Cattlemans Bridge but develop an accessible launch site for those wishing to explore the Oxbow area. Development at the site will be kept to a minimum. The topography provides easy access to the river with minimal environmental effect; this site is appropriate for all types of users because they

PART ONE, INTRODUCTION

"Water is inspiration, recreation and refreshment to humans. The wonders of waterfalls, springs and geysers, and the pleasures of swimming, rafting, hiking, fishing and boating park lakes and streams, draw and delight park visitors." - Park Waters in Peril, National Park's and Conservation Association.

PART ONE, INTRODUCTION

Grand Teton National Park consists of approximately 310,000 acres in northwestern Wyoming's Teton County. Bordered by two national forests, the John D. Rockefeller Jr. Memorial Parkway and Yellowstone National Park, Grand Teton National Park occupies a central position in the 13.3 million acres of federally-owned land referred to as the Greater Yellowstone Area.

The intent of this updated Snake River Management Plan is to provide the National Park Service with direction for long-range management of the Snake River Corridor from the Jackson Lake Dam to the park's south boundary. The northern section of river from the south boundary of Yellowstone to Jackson Lake will be addressed in a subsequent plan. This plan sets forth the management philosophy for the Snake River Corridor and provides strategies for addressing issues and objectives based on that philosophy.

This section, Part One, contains a general summary of the natural history of the Snake River Corridor, a justification for an updated Snake River Management Plan and an overview of past legislation and planning pertaining to the area. Part Two identifies the issues related to the corridor and describes management objectives for this plan. Part Three chronicles the existing conditions on the river. Part Four describes the plan developed to resolve the issues. Finally, Part Five defines indicators and standards relating to the desired future conditions. It also outlines future monitoring and research needs.

Geologists regard the Teton Range as one of the most impressive examples of fault-block mountains in the world. The peaks of the range, which tower 3,000 to 7,000 feet

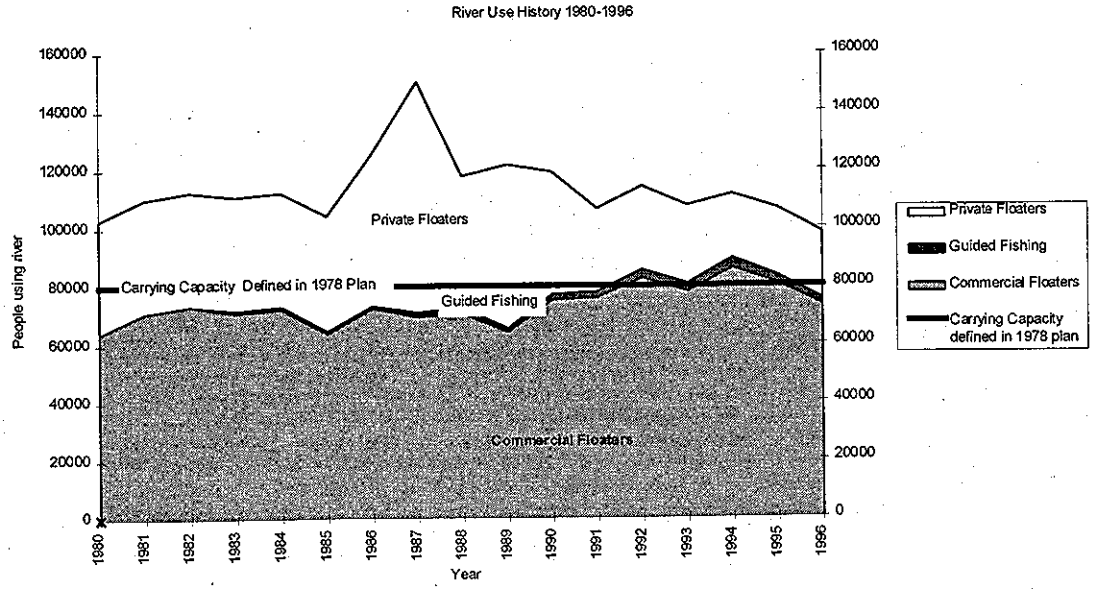
above the sagebrush flats and riparian Snake River environment, culminating in the Grand Teton (13,770 feet), dominate the park's landscape. The mountains began to rise about nine million years ago and are the youngest in the Rocky Mountain chain. Several piedmont lakes rimmed by moraines from the last glaciation period lie at the foot of the Tetons, forming part of the scenic foreground. The Snake River riparian zone, with its colorful cottonwoods and outstanding wildlife habitat, lies in the foreground.

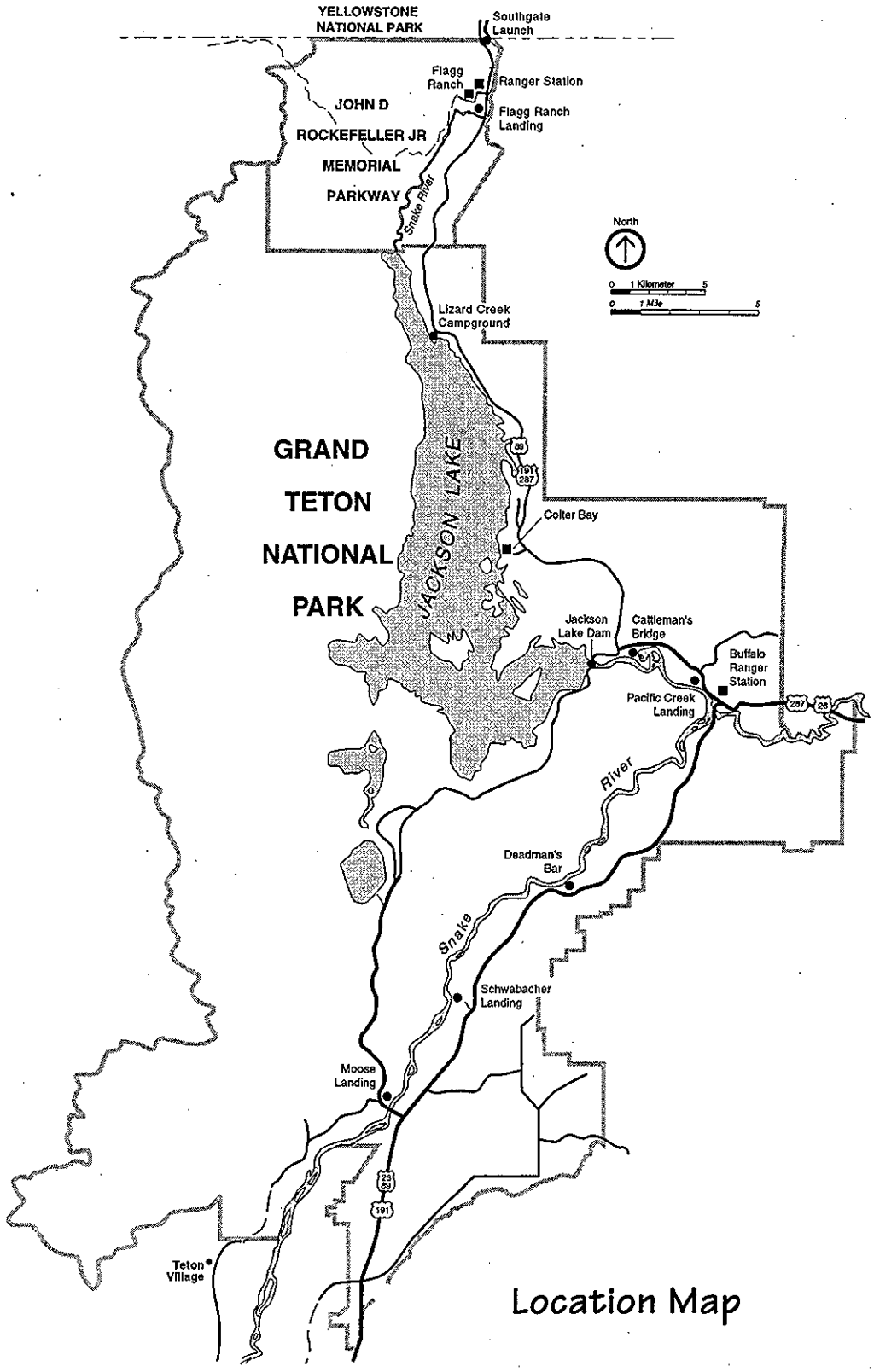
The Snake River originates in the highlands of northwestern Wyoming's Teton Wilderness Area, flows west through a portion of Yellowstone National Park, south through John D. Rockefeller Jr. Memorial Parkway and then enters Jackson Lake in Grand Teton National Park. After leaving the lake, the Snake River flows east and then south for about 25 miles before crossing the south boundary of Grand Teton National Park.

The popularity of float trips on the Snake River in Grand Teton National Park has increased steadily in the last decade. Between 1985 and 1996, total annual float trip use (expressed as numbers of people participating) in the 25-mile section of the river between Jackson Lake Dam and Moose increased an average of 6.8%. The greatest increase in overall use occurred during 1987 with an increase of 44% during that year. The greatest increase in type of use has occurred on commercial river trips, with scenic floats increasing 39% and guided fishing trips increasing 230% since 1985.

Scenic floating, as it has evolved in Grand Teton National Park, is generally a brief daytime activity. Fishing trips usually last all day. A float or fishing trip on the Snake River offers the visitor an unparalleled opportunity to observe and photograph the outstanding mountain scenery, while leisurely traveling through some of the best wildlife habitat in the area.

At present levels of use, scenic floating and fishing have caused some impacts on natural resources. Damage to or elimination of vegetation and accelerated erosion of





Location Map

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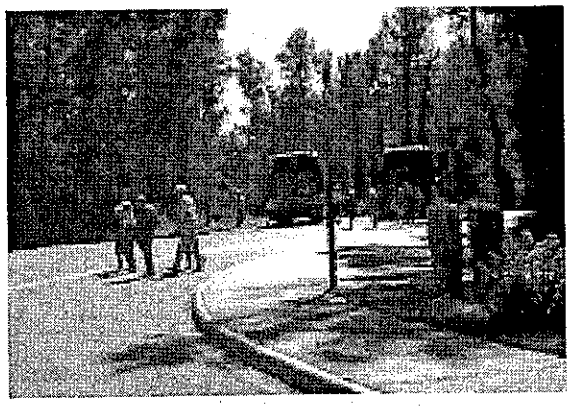
stream banks are evident in all access areas.

More serious is the apparent deterioration of intangible resources—those factors that make floating and other visitor activities in a natural area enjoyable and unique. Crowding, queuing, dust and noise are common daytime features at many of the access areas. During most summer days, floaters see numerous other boats between Deadmans Bar and Moose. When the river clears and fishing conditions are good, a scenic floater on the river passes many anchored fishermen, which detracts from the wilderness experience. Conversely, fishermen on the river are affected by a steady stream of scenic floaters. Consideration of these factors suggests that present levels of river use are near (or may exceed) the optimum capacity and suggest that additional detractions or significant increase in use should be avoided.

THE NEED FOR THIS PLAN

The most recent Snake River Management Plan was completed in 1975 and updated in 1981. Since that time river use has steadily increased, placing demands and pressure on resources and existing facilities. In June 1994, the Snake River Corridor Project was organized as a multi-agency planning cooperative. The intent of the Snake River Corridor Project was to initiate dialogue between the different management agencies in order to coordinate management of the Snake River Corridor from Jackson Lake Dam to Palisades Reservoir. The Snake River Management Plan for Grand Teton National Park will tier off of the Snake River Corridor Project.



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PROJECT SCOPE AND OBJECTIVES

The National Park Service determined that an updated Snake River Management Plan was needed not only to resolve present issues, but to ensure wise choices for future management and use of the river corridor.

This Snake River Management Plan builds upon the goals set forth in the Grand Teton National Park Master Plan and Statement for Management which are discussed later in this chapter. Once finalized, it will guide National Park Service stewardship of the river corridor. The plan has been designed to achieve the following objectives:

- Identify the biological, cultural and scenic values that define the unique character of the Snake River Corridor.
- Identify key issues to be resolved in this plan.

- Formulate a management framework that responds to the issues and effectively guides National Park Service management of the river corridor.

- Determine the appropriate carrying capacities for visitor use of the river corridor.

- Present alternatives for visitor use of the river corridor.

- Develop a resource monitoring and implementation schedule for the completed plan.

LEGISLATIVE AND PLANNING HISTORY

Park Purpose

Grand Teton National Park was established to protect the area's spectacular scenic values, as characterized by the geologic features of the Teton Range and Jackson Hole, and the native plant and animal life. The original Grand Teton National Park (about 96,000 acres) was established by Congress on February 29,1929 (45 Stat. 1314). The park was enlarged to its present size by Congress on September 14, 1950 (Public Law 81-797, 64 Stat. 849), to include a portion of the lands within Jackson Hole National Monument. The national monument had been established by Presidential Proclamation (No. 2578, 57 Stat. 731) on March 15, 1943.

Planning Background

There are currently three plans that address protection and visitor use of the Snake River Corridor. These plans all share one theme: protecting the natural and cultural resources and providing for a quality visitor experience. Below is a summary of each of these documents.

Master Plan

Grand Teton National Park's Master Plan, approved in 1976, provides general direction for management of the park. This master plan introduces a number of management objectives, which directly influence the Snake River Management Plan. These objectives are:

- To manage access points to the Snake River for scenic and fishing float trips, so as to perpetuate a natural and wilderness-type environment through which float-trip groups can travel. This will be done by undertaking studies to determine the capacity of visitor use on and along the Snake River.

- To manage the Snake River cutthroat trout so as to ensure the perpetuation of a native wild population as part of a natural ecosystem within its range in Grand Teton National Park.

- To manage the biotic resources of the park for the purpose of perpetuating the indigenous plant and animal associates of the Teton Range and Jackson Hole, in as natural a condition of dynamic equilibrium as is feasible.

- To interpret the historical resources within the park, not only by giving attention to the human historic niche in this environment, but by interpreting the historical events that took place at Cunningham Cabin, Menor's Ferry, and Maude Noble Cabin, in context with the nation's history in general.

Statement for Management

A more recent planning document containing management objectives that directly relate to management of the Snake River Corridor is the Statement for Management which was approved in October, 1989. The following management objectives contained in that document relate to this planning effort:

- Manage the Snake River as a natural environment by limiting development and use levels.
- Maintain all waters in Class I condition.
- Manage all park natural resources under ecosystem concepts that are aimed at perpetuating natural systems rather than individual species or features.
- Establish ecologically-sound limits and manage all activities and uses to ensure compatibility with the preservation of park resources and a positive visitor experience.
- Preserve, manage, and display sites, buildings, and objects that are significant and represent the broad sweep of western history and prehistory.
- Provide future generations the opportunity to enjoy, comprehend, and appreciate these tangible resources and their historical significance.

Existing Snake River Management Plan

By the mid-1960's there was concern that increasing commercial float trip traffic on the Snake River was having detrimental effects on the Snake River corridor within the park. In 1969 the Secretary of the Interior indicated the need to establish recreational carrying capacities for national parks, and as a specific example of a use needing limitations, the Secretary cited float trips on the Snake River in Grand Teton National Park. In addition, the National Park Service is required by law to address carrying capacity in planning for parks: the 1978 National Parks and Recreation Act (P.L. 95-625) requires each park's general management plan to include *identification of and implementation commitments for visitor carrying capacities for all areas of the unit.* Part five of this plan contains a complete description of the carrying capacity concept and process for meeting this objective.

On August 28, 1974, the Director of the National Park Service issued a river running policy statement which directed all parks having river boating activities to develop management plans by April 30, 1976. The policy required that carrying capacity be determined for each river, that an interim capacity could be established if additional data were needed, and that use could be rationed if it exceeded the determined capacity.

As directed by this policy, Grand Teton National Park developed the Snake River Management Plan (Grand Teton National Park 1975), which went into effect in April 1975 and was incorporated into the Natural Resource Management Plan.

The Snake River Management Plan of 1975 was reviewed and updated by park management in the fall of 1981.

PLANNING BY OTHER AGENCIES WHICH AFFECTS THE SNAKE RIVER

Snake River Corridor Project

The Snake River Corridor Project is a cooperative planning effort currently being undertaken by fifteen agencies and organizations. The Snake River Corridor project was initiated with the hope of conserving the corridor's natural resources while balancing demand for recreational use and community needs for housing, transportation and utilities. The project provides a framework for coordinating numerous agency management efforts affecting the Snake River. The focus of the project is the 69-mile reach of the Snake River from Jackson Lake Dam to Palisades Reservoir.

The mission of the Snake River Corridor Project is *"to promote coordinated, broadly-supported management of the Snake River Corridor that protects and enhances natural resources and appropriate recreational opportunities."*

The project goals are:

- To preserve and enhance the natural character of the Snake River Corridor.
- To provide improved recreational opportunities within the corridor, consistent with minimum impact upon river resources, adjacent private lands, and quality of experience.
- To create a system of cooperative planning and river management between local, state, federal agencies, and community organizations.
- To date, the project has held several public workshops to identify concerns about the river corridor and develop goals for the project, and to increase communication and cooperation between agencies and organizations.

Bridger-Teton National Forest

The Bridger-Teton National Forest completed its Snake River Final Area Analysis in August 1996, which addresses the 25.5-mile section located above the Palisades Reservoir, beginning at the South Park Bridge. This plan is designed to meet the following objectives:

- Provide a variety of high quality recreational river experiences, reduce ramp congestion, and maintain scenic quality.
- Reduce visitor conflicts and improve safety.
- Reduce problems associated with camping.
- Provide long-term protection for wildlife and plants.
- Improve the self-sufficiency of the field program to provide on-the-ground visitor services.

Bureau of Reclamation

The Jackson Lake Dam Instream Flow Study Preliminary Recreation Impact Assessment was undertaken by the Bureau of Reclamation to determine how flow regimes from the Jackson Lake Dam might impact recreational activities of the upper Snake River Corridor.

Initial results of this study indicate that boat launch sites are reaching facility carrying capacity. The study states that conflicts have occurred at these sites, primarily between commercial users and private boaters. According to the study, water level changes on the Snake can and do impact carrying capacity by increasing and decreasing demand for numbers of river trips. More research is needed on effects of water on number of river trips to offer an optimum low recommendation.

Two social carrying capacity conflicts are identified in this study that apply to the park's section of the river:

1. Scenic float guides and customers on the river perceive increasing numbers of fishermen as impacting their pristine experience and ability to view wildlife. Fishermen are observed more often than floaters on the river because they stop or slow down to fish and are passed by other boaters. Floaters primarily impact each other at the river put-ins; since they move down river at the same speed as the current, they seldom see each other otherwise.

2. Another conflict exists between commercial outfitters and private rafters. Private rafters see outfitters as controlling and dominating river opportunities, while commercial rafters see private rafters as a threat due to their growing numbers.

This study goes on to suggest that these conflicts can be solved through management schemes. Problem one can be solved through zoning of the water: the conflict between floaters and anglers can be reduced by providing early season (mid-June) high runoff flows combined with sustained releases of approximately two weeks. This type of flow rate would flush the river, making multiple channels of the braided sections of river navigable. This would increase carrying capacity, allowing floaters to see fewer fishermen and possibly more wildlife. The study also suggests designating time blocks mainly for private rafters and for limited commercial rafting. These blocks for private rafters should be during off-peak times.

The study also proposes periodic spring flushing of side channels and isolated points along the river, which is considered to be of great benefit to the natural system as well as the recreational users. These high flows clear debris from the channels, making them navigable, thereby increasing the variety of opportunities for fishing and wildlife viewing for scenic floaters. They also reduce conflicting encounters between rafters and fishermen. This high water revitalizes the riparian systems providing nutrients and cleaning silt deposits from gravel beds. Additional mid-size gravel is moved by these flows into the mouths of side tributaries refreshing valuable cutthroat spawning habitat.

Wyoming Game & Fish

The Wyoming Game & Fish Department has been a cooperating agency in managing the fisheries of the Snake River. This agency developed a management plan for the Snake River Basin in November, 1995. It contained the following management objective:

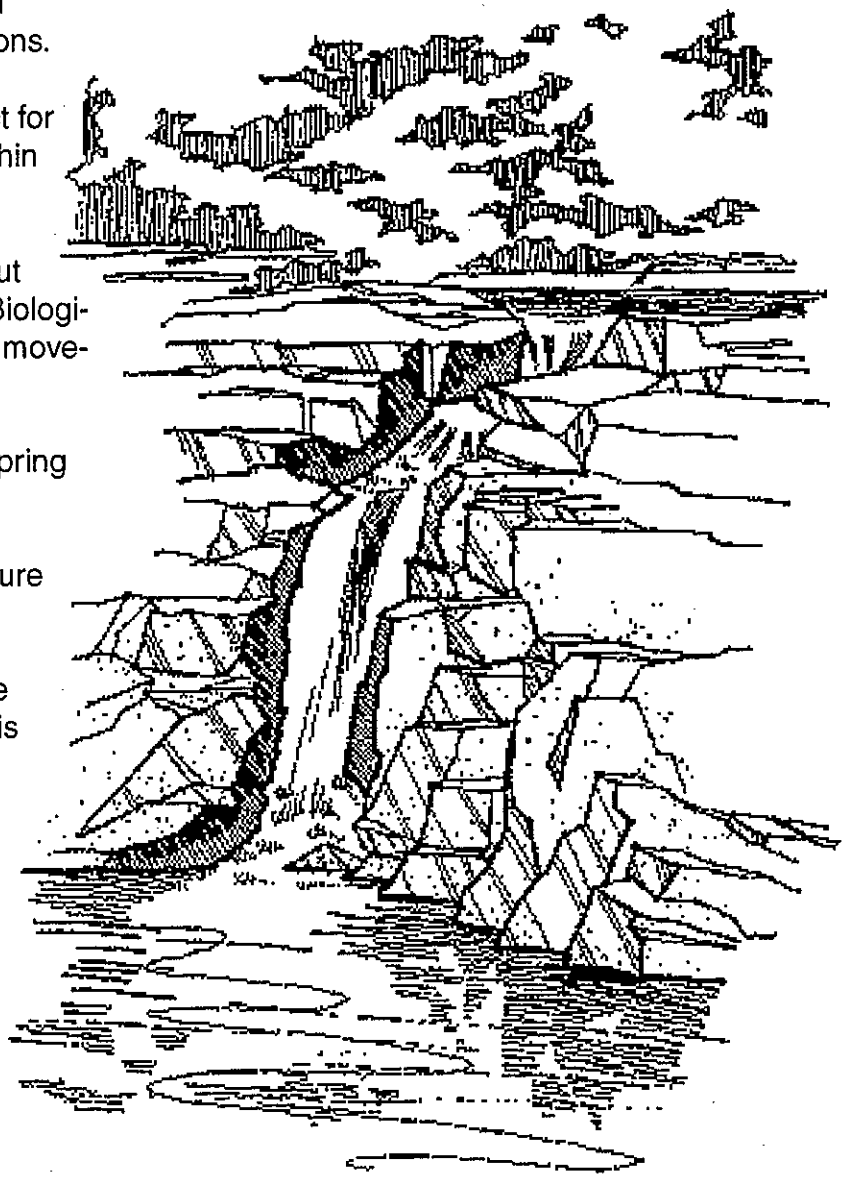
The principle management objective in the Snake River drainage is to preserve the wild trout fishery and the integrity of the indigenous Snake River cutthroat trout. Maintaining the supply and increasing the diversity of sport fishing opportunities in the drainage is also a primary management objective.

In October of 1990, a contract was signed between the State of Wyoming and the Bureau of Reclamation (BOR) for 33,000 acre-feet of water. The water is used to seasonally enhance instream flows below Jackson Lake Dam.

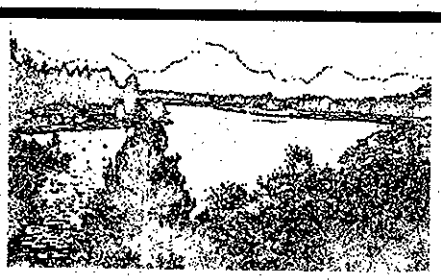
Future Management Activities

Wyoming Game and Fish has proposed the following actions for the Snake River:

- Maintain current management activities and continue as the lead agency in the management of Wyoming's fisheries resources.
- Continue to monitor biological and social response to special regulations.
- Pursue a habitat restoration project for the Upper Bar BC spring creek within Grand Teton National Park.
- Initiate a Snake River cutthroat trout telemetry study with the National Biological Service to determine seasonal movements.
- Rejuvenate spawning gravels on spring creeks as necessary.
- Update drainage surveys as pressure warrants.
- Inventory streams and lakes where information on non-game species is limited or lacking.



PART TWO, PLANNING ISSUES



"A river traverses time as well as topography it runs not only through country but through mankind." Wallace Stegner

PART TWO, PLANNING ISSUES

The issues presented in this section establish the framework for the entire Snake River planning effort. They are the culmination of information gathered from public workshops, written comments, consultation with other public agencies, and in-house meetings with NPS staff.

PUBLIC PARTICIPATION

From the outset of the planning process, public input played a critical role in determining the problems and opportunities that would be addressed by the plan. To date, three public workshops have been held, during November 1994, June 1994, and March 1995. In addition, two open houses were held for float and fishing trip permit holders in October 1995 and 1996 to hear some of their comments and suggestions about river regulations, manipulation and commercial use. An additional meeting was held in conjunction with the U.S. Forest Service in February 1997 to discuss possible options for managing commercial fishing.

A Draft Snake River Management Plan was released for public review for a 60 day period from August 13 through October 15, 1996. A second Snake River Management Plan/ Environmental Assessment was released for a 45 day public review in April 1997, ending on June 2, 1997.

A toal of 28 comments were received, and those comments are incorporated throughout this plan.

PLANNING ISSUES

Listed below and continuing on the following pages are the planning issues that were identified as critical to the creation of a river management plan that is environmentally-sensitive and responsive to the needs of park visitors.

All of the planning issues share one topic: the level of different types of recreation use on the river. How much recreation use can and should the river support? Visitors to the Snake River were estimated to be over 104,700 in 1996, while the previous Snake River Management Plan defined the river's carrying capacity at 80,000. The general goal of this plan is to provide a range of rewarding recreational opportunities

while protecting the natural and cultural resources of the river corridor.

Resource Protection and Enhancement

Public opinion obtained during the scoping process emphasized the desire to maintain the river's natural character in order to protect wildlife and scenic quality. These values must be of primary importance in the formation of this management plan.

Fisheries

The primary limiting factors affecting fisheries in the Snake River are winter flows, loss of instream habitat, and loss of spawning areas. Reduced winter flow below Jackson Lake Dam limits the amount of wintering habitat. Dikes encourage aggradation and loss of instream structure and prevent cottonwood regeneration within the riparian areas. Spawning habitat is degraded where livestock and wildlife winter along spring creeks. Also, flooding and gravel rejuvenation in tributary spring creeks has been greatly reduced by dike construction, resulting in a continuing loss of spawning areas.

Hydrology

It should be determined how fluctuating water levels caused by dam operations affect other wildlife, particularly waterfowl and other shore-nesting birds and amphibians.

Changes in river structure caused by the dam's artificial flows should also be explored. Floods are now infrequent and high flows have been nearly eliminated. How the river's braiding pattern, sandbars, floodplain, riparian areas, and banks are affected by these changes should be investigated.

Vegetation

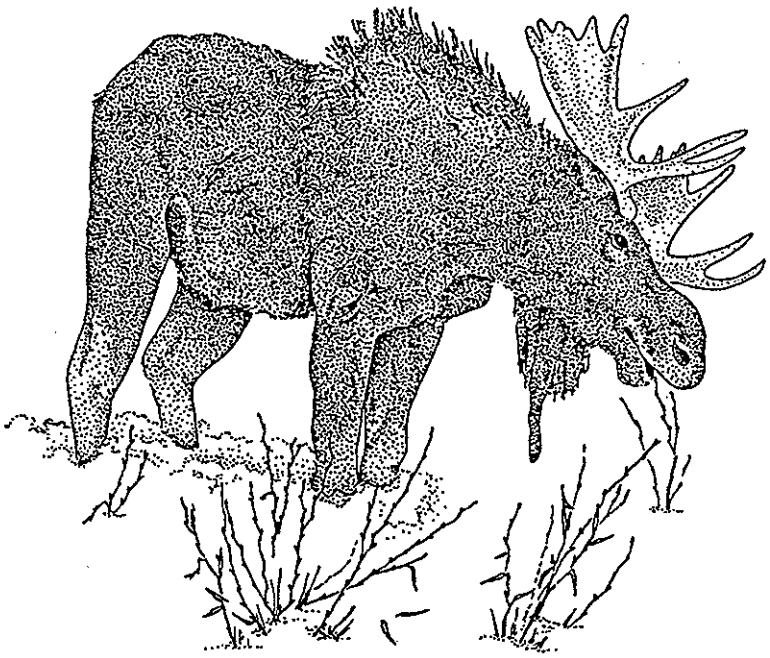
The observed decline in cottonwood seed regeneration in riparian areas should be explored in light of dam openings and closures. In order to germinate, cottonwood seeds must be carried by water over gravely areas for scarification and then deposited in soil where there is little competition. Cottonwood, a shade-intolerant species, is being outcompeted by Colorado blue spruce, a species not native to western Wyoming (B. Smith, pers. comm.). The effects of artificial river flows on cottonwood seed regeneration need to be thoroughly investigated.

Heavily used areas such as launches, concessions picnic sites, fishing spots, and parking areas along the river present special issues. The extent of site degradations, such as soil erosion, soil compaction, and vegetation trampling at these disturbed areas, needs to be addressed and quantified.

Wildlife

Areas within 1/2 mile from known eagle nests are closed to public access from February 1 to August 15. Eagles complete nesting and fledging of young during this time period. It needs to be determined whether the 1/2 mile distance is adequate to protect the nesting territories of this species.

Temporary habitat closures for other species should also be explored. Areas within 250 yards of the nesting sites of osprey, trumpeter swan, and great blue heron are presently closed from February 1 to August 20, when posted. It has been determined that osprey and herons complete nesting and fledging of young during this time period, but trumpeter swan cygnets do not fledge until mid-September. Perhaps swans should not be included with the other species, but should have their own extended closure.



Drawing by Denise Casey

Trumpeter swans do not presently nest in the river bottom areas, but historically they nested in the Oxbow Bend. It is likely that swans abandoned this nesting territory because of human disturbance. Lockman (1988) reported that shoreline fishing, visitor activity, and boating on the Oxbow markedly decreased the capability of this area to support breeding swans. A closure might make the area more attractive in the future to a swan pair seeking a breeding territory.

In addition, two great blue heron rookeries in the Oxbow Bend have not been used in a number of years. The Northeast Island rookery last produced young in 1984, and the West Island rookery has not been productive since 1990 (Reid 1994). More research is needed to determine the effects of human activities on heron nests.

Wintering wildlife is presently protected by the December 15 to April 1 river bottom closure, which extends from the dam south to Menor's Ferry. This also protects the nesting activities of raptors and other birds not included by the aforementioned closures.

Visitor Use

The impact that river users have on wildlife should also be explored. Impacts to wildlife including elk, deer, bear, or bison have never been adequately quantified.

Several commercial companies have used meal sites along the river for their guests. The Lodge Company also uses a picnic site in the Oxbow area to host meals for up to 500 people at a time (Oxbow files, S&RM). The effects of these activities on wildlife and vegetation have

not been quantified. A decision should be made about whether these types of activities are appropriate in the river bottom, especially in sensitive riparian areas such as the Oxbow.

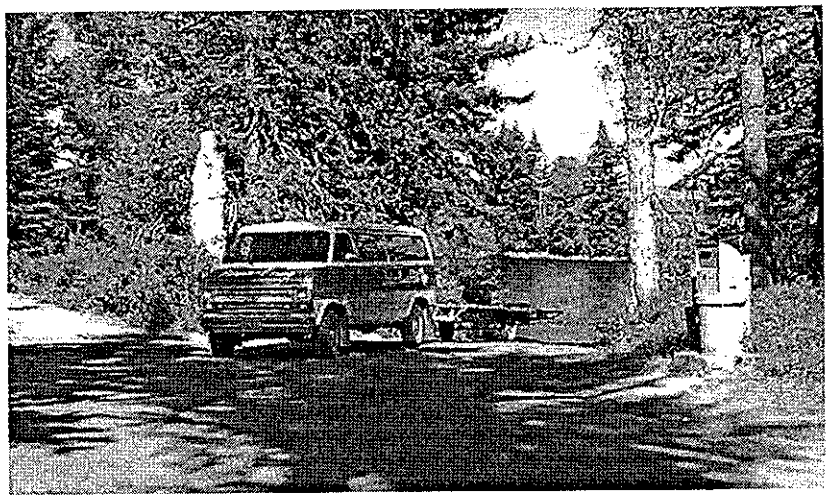
A related issue concerns bear attractants which are frequently made accessible to bears and other wildlife along the river by park visitors and concession companies (Baptiste and Cain 1993, 1995). For example, undesirable fish caught below the dam are often left on the shore to decompose in a location heavily used by visitors and frequented by bears. Also, panhandling bears have obtained garbage scraps in recent years at the Grand Teton Lodge Company's Deadmans Bar picnic site, which is located in prime bear habitat.

With grizzly bears now known to be moving through the riparian areas, the issue of unsecured bear attractants presents a critical safety concern for park visitors: in 1994, a grizzly bear with three cubs moved through the vicinity of the Triangle X riverside picnic site (Baptiste and Cain 1994).

Access

Current boat launch areas become crowded during the summer months, with boaters waiting in line to launch or exit the river. At some access points, gravel builds up and impedes launch use. The number and location of launch sites need to be reviewed and alterations to the landings evaluated: should there be slip clearance or dredging, alternate locations as the river character changes, or permanent vs. temporary landings designated?

Parking at some launch areas becomes congested and is not well defined. At times, the vault toilets at Deadmans Bar and Pacific Creek have long lines. What level of development is appropriate at the launch areas that will not further impact the riverine environment?



Commercial and Private River Use

The perception exists that the river may become overcrowded in the future. This perception ties in with the often misunderstood concept of carrying capacity.

Carrying capacity means the amount and type of recreational use an area can accommodate without altering either the environment or the user's experience beyond the degree of change deemed acceptable by the management objectives for the area.

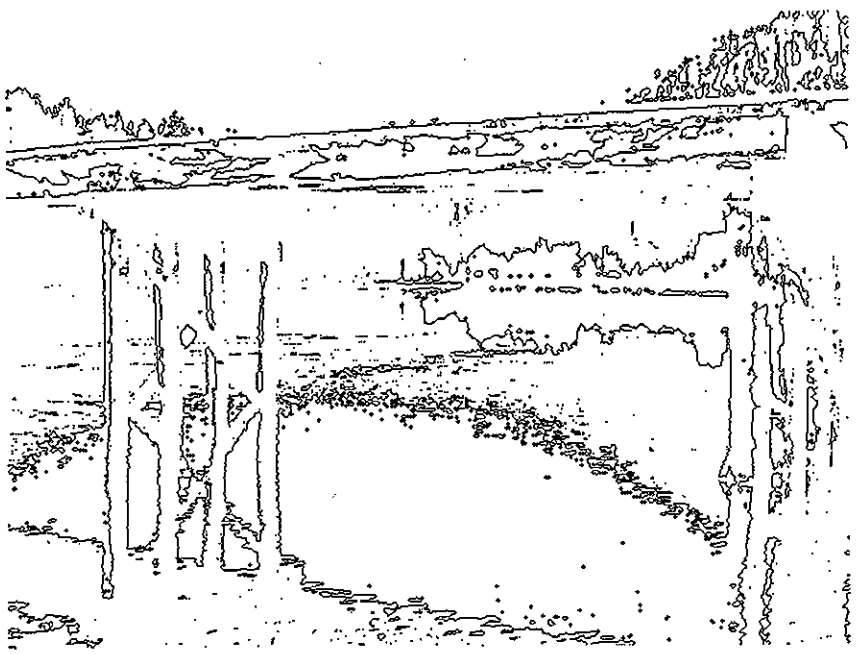
If use of the Snake River continues to advance at the current rate, there will be increased stress on aesthetic and wildlife resources. This stress will be caused by the growing number of largely unregulated non-commercial and guided fishing boats and increased use of commercial scenic launches.

What is now needed is a reevaluation of carrying capacities for the Snake River, based on scientific recommendations. This reevaluation will then establish updated management objectives for the river, to determine acceptable upper limits of use. In addition to developing new carrying capacities, methods for staying within these limits need to be generated and explored.

THE GOALS OF THE SNAKE RIVER MANAGEMENT PLAN

The basic goals of Grand Teton National Park in the management of the Snake River reflect those of the NPS as expressed in the National Park Service Act of 1916 and the Redwoods Act of 1978. The main objective is to *"...conserve the scenery and natural and historic objects and wildlife therein and to provide for the enjoyment of the same [and] leave them unimpaired...."* These legislative mandates are the driving force behind management decisions affecting NPS areas across the nation. The mandates which apply to this project are:

1) To preserve the natural resources and environmental processes of the Snake River corridor and the associated riparian and river environments. To protect the Snake River and its riparian environment from unacceptable change caused by human activities.



2) To protect and preserve the historic resources in the river corridor and associated environments.

3) To provide Snake River users the opportunity to participate in and appreciate a variety of unique experiences offered by Grand Teton National Park as a whole and by the riverine environment in particular. To provide an opportunity for all participants to enjoy a rewarding river-running experience.

4) To provide a quality Snake River experience through Grand Teton National Park:

a) By determining the impact of crowding and use levels on visitor experience.

b) By then establishing a human use capacity and a limitation on use that protects the river's natural resources and processes.

5) To provide opportunities for people of various ages and abilities to participate in river trips.

PART THREE, RESOURCE OVERVIEW

"The Snake is the largest river in Wyoming, and tenth longest in the United States.... The river through Jackson Hole may be the richest high elevation riparian habitat in the nation... There is no North American rival combining wildlife and mountain scenery..."
Tim Palmer. "The Snake River: Window to the West"

PART THREE, RESOURCE OVERVIEW

This section presents a description of the environment and factors affecting the Snake River corridor in Grand Teton National Park. A variety of documented literature contributed to the construction of this overview. A portion of information was adapted from the existing Grand Teton National Park Snake River Management Plan documented in 1975. Other reference materials are cited in the bibliography.

NATURAL RESOURCES

Topography & Geology

A prominent visual feature of Grand Teton National Park is the abrupt rise of the Teton Range from the Jackson Hole valley floor. These mountains formed through normal faulting processes, which began approximately nine million years ago. Within the park, the Tetons rise to 7,000 feet above a valley which spans about forty-eight miles along a general north-south axis, extends three to twelve miles wide, and lies between 6,000 and 7,000 feet above sea level.

The geology of the Jackson Hole area is one of the most documented in North America. Sedimentation and extensive erosion has occurred due to various stages of volcanism, glaciation, and uplift (Kiefling 1978). Along the base of the Teton Range, a series of large piedmont lakes mirror the peaks. Of these glacier-formed lakes, Jackson Lake is the largest. Relatively small streams drain from the steep-walled canyons along the east front of the range while larger tributaries from the north and east drain out of the highlands. All of these streams flow into the Snake River.

The Snake River and surrounding lowlands were formed during three different glacial periods: the Paleozoic, Mesozoic, and Tertiary, whose features are geogically young. Sand, gravel and boulders are remnants of alluvial and glacial deposits from these three periods (Kiefling 1978). Glacial and recent

alluvial terraces parallel the present flood plain throughout sections of river within the park. South of Jackson Lake, the Snake River has cut into outwash of the most recent glacial advance and the substrate consists almost entirely of quartzite cobbles embedded in a sandy-silt matrix. The river is relatively active on its floodplain and is braided throughout nearly half its length in the park. Recent Teton fault activity has caused a westward shift in the course of the river through Jackson Hole.

Soil

Soil samples of the Snake River floodplain and terraces within Grand Teton National Park consist primarily of sandy to coarse loams. These soil sections were formed in alluvium and glacial deposits and are characterized by being very deep. Soil found on the low percentage slopes of the floodplain is generally poorly drained, whereas soil found on the steeper slopes extending from the floodplain to the foothills is well drained (USDA 1982).

Hydrology

The Snake River is a complex water system both in and outside Grand Teton National Park. Draining approximately 3,465 square miles in Wyoming, this major tributary of the Columbia River originates on the western slope of the continental divide in northwest Wyoming's Teton Wilderness Area. Flowing westward, the river passes through a portion of Yellowstone National Park, south through John D. Rockefeller, Jr. Memorial Parkway and enters Jackson Lake within Grand Teton National Park boundaries. At this point the drainage area covers 486 square miles (USGS survey 1994).

Jackson Lake presently encompasses an area of 25,730 acres and is used to store water for irrigation in Idaho's Snake River Valley. The reservoir was first built in 1906 by installing a log crib dam at the outlet of the natural lake to create a usable capacity of 300,000 acre-feet. This dam washed out in 1910 and was replaced by an earth dam, increasing usable capacity to 380,000 acre-ft. Usable capacity was subsequently increased to 790,000 acre-feet in 1916 when the earth dam was raised, and then to 847,000 acre-feet in 1917 by dredging the outlet. The Bureau of Reclamation rebuilt the dam between 1987-89, maintaining the same capacity (USGS 1994).

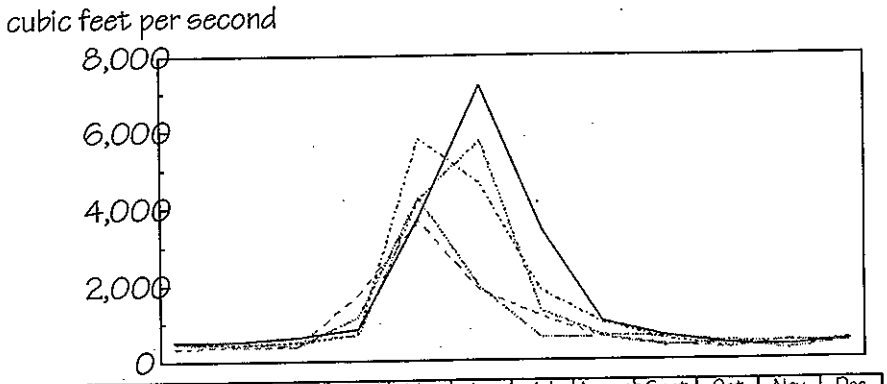
The Snake River flows east out of Jackson Lake and then south for about 25 miles before crossing the south boundary of the park. The Bureau of Reclamation dam at the outlet of Jackson Lake regulates the flow for four miles downstream where two major tributaries, Pacific Creek and Buffalo Fork River, discharge into the Snake River. Additional smaller tributaries flow into the river in this stretch of water. As it exits the park, the river flows south and west through the valley of Jackson Hole for about 47 miles. It then turns south and east, following a fault structure, and enters the steep-walled Snake River canyon through which it flows south and then west into Idaho where it enters Palisades Reservoir.

Water Quality

The chemical quality of the water in the upper Snake River is good, being slightly alkaline (ph 7.6-8.4) with relatively small amounts of dissolved materials. (Dissolved solids vary throughout the year from 86 to 251 mg/liter.) Both alkalinity and dissolved material increase somewhat downstream.

Water Flows

Jackson Lake Dam
Average Outflows
1991-1995



	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1995	525	511	624	840	3,802	7,204	3,422	1,018	634	406	366	502
1994	484	538	390	1,139	4,245	1,921	597	615	367	436	265	458
1993	504	467	481	703	5,819	4,619	1,814	987	553	335	343	521
1992	360	388	401	1,724	3,645	1,833	1,152	605	403	320	485	427
1991	489	426	526	693	4,215	5,745	1,285	653	601	477	452	467

Section 9 of PL 87-187 (64 Stat. 849) and a Memorandum of Understanding dated November 29, 1956, between the National Park Service and the Bureau of Reclamation, provide for the operation guidelines of Jackson Lake Reservoir. Congress clearly intended that expansion of the park would not conflict with Bureau of Reclamation operations or with the rights of the space holders in the reservoir. The Bureau retains complete and exclusive control of the flow and use of water in the reservoir including the right to raise and lower the water level at will; however, the Bureau will consider maintaining a constant level from June through September and will consult with the NPS before developing anything in the operation zone that might affect recreational facilities or use.

In October of 1990, a contract was signed between the State of Wyoming and the Bureau of Reclamation (BOR) to maintain minimum acceptable flow levels of 280 cubic feet per second (CFS) during the winter to protect the trout fishery. According to Annear (1989), "management objectives for the Snake River should emphasize establishment of historic average releases or natural instantaneous inflows to the reservoir, whichever is less, as a base flow to the river." A release of 400 cfs, which is slightly less than an average winter flow, is recommended as the optimal minimum winter flow. A flow of 400 cfs would protect the Jackson Lake lake trout fishery, avoid conflicts with water rights, and maintain downstream fisheries at historic levels. A flow of 280 cfs was determined to be an acceptable minimum release level (WY Game & Fish 1992).

Climate

The northwest Wyoming climate is characterized by short, cool summers and falls, and long, cold winters which tend to linger late into the spring. The combination of high elevation, low humidity and surrounding mountain ranges cause this cool climate which has a large diurnal temperature range. During summer months, daytime highs of 70-80 degrees F are commonly replaced by nighttime lows below 40 degrees F with potential for subfreezing temperatures during all summer months. Winter minimum temperatures of minus 40 degrees F are often recorded, with a record of minus 63 degrees F observed at Moran on February 9, 1933.

Precipitation in the area varies considerably. Southwest winds blowing against the Tetons, a range oriented from north to south, create a rain shadow on the mountains' east side (Dirks & Martner,Anderson). Additionally, precipitation is greater in the northern part of Jackson Hole because the southern portion of the Teton Range is higher in elevation. About 75 percent of annual precipitation is in the form of snow, between November and April, when ground snow cover is usually continuous.

Vegetation

Climatic, topo-edaphic, and disturbance factors create a mosaic of vegetation communities in the Snake River floodplain, terraces, and Jackson Lake area within Grand Teton National Park. This mosaic consists of forested and non-forested lands, varying in age and species composition (Anderson 1994). Vegetation in the Jackson Hole valley can be categorized into the aquatic, riparian, and upland zones.

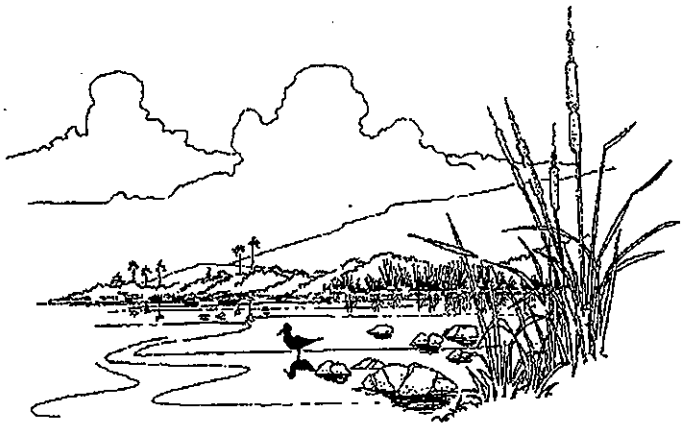
Drawing by Denise Casey

In the aquatic zone, consisting of aquatic and semi-aquatic vegetation in the flood channels and tributaries, watercress (Rorippa nasturtium-aquaticum), white watercrowfeet (Ranunculus aquatilis), and pondweed (Potamogeton spp.) are most prevalent. Watercress is found primarily in the shoreline areas; white watercrowfeet is associated with gravel-rocky bottom environs; pondweed with silt bottom areas. Other major species found in the aquatic zone are star duckweed (Lemna triculca), water milfoil (Myriophyllum spp.), mare's tail (Hippuris vulgaris), monkey flower (Mimulus glabratus), and horsetail (Equisetum fluviatile) (Kiefling 1978). Moss and algae are also in this zone. Both encrusting and filamentous algae are present in the river proper, with encrusting algae most common in swifter water.

A variety of vegetation species inhabit areas immediately surrounding and paralleling Jackson Lake and the Snake River. This area is what is known as the riparian zone. The riparian zone frequently has a high number of edges and strata in a comparatively small area. This results in a habitat which produces a large number of species, reflecting the diversity of plant species and community structure (Thomas et al. 1979). Sandbars, gravelbars, and abandoned river channels provide substrate for pioneer terrestrial plant communities. Narrowleaf cottonwood (Populus angustifolia) usually develops on gravel, interior willow (Salix interior) on sand, and blueberry willow (Salix pseudocordata) on silt and flooded areas.

In succession, these plants are often replaced by climax blue spruce (Picea pungens) in wetter sites and by sagebrush or bunchgrass in more xeric locations (Kiefling 1978).

The most conspicuous plant community in the riparian zone is the floodplain forest which, in addition to climax blue spruce and



narrowleaf cottonwood, contains lodgepole pine (Pinus contorta), quaking aspen (Populus tremuloides), russet buffaloberry (Shepherdia canadensis), red osier dogwood (Cornus stolonifera), thinleaf alder (Alnus tenuifolia), balsam poplar (Populus balsamifera), and willow (Salix spp.). The understory contains a mixture of western wheatgrass (Agropyron smithii), alpine timothy (Phleum alpinum), bluegrass (Poa spp.), brome grass (Bromus spp.), yellow sweetclover (Melitotus officinalis), elk thistle (Cirsium foliosum), redtop (Agrostis spp.), snowberry (Symphoricarpus spp.), and woods rose (Rosa woodsii).

Another plant community associated with the riparian zone is the marshy meadow. In addition to willow, marshy meadows contain sedges (Carex spp.), bluegrass (Poa spp.), tufted hairgrass (Deschampsia caespitosa), rushes (Juncus spp.), and shrubby cinquefoil (Potentilla fruticosa).

The upland zone, also known as the outwash plain, exists on more xeric or drier sites. The upland zone, extending from the river terraces to the foothills, takes up a large portion of the valley floor. This zone provides ideal conditions for vegetation such as big sagebrush (Artemisia tridentata), low sagebrush (Artemisia arbuscula), bitterbrush (Purshia tridentata), rabbitbrush (Chrysothamnus spp.), yarrow (Achillea lanulosa), bluebunch wheatgrass (Agropyron spicatum), Idaho fescue (Festuca idahoensis), balsamroot (Balsamorrhiza sagittata), lupine (Lupinus spp.), and wild buckwheat (Eriogonum spp.). Existing in this upland zone is the sagebrush-forest ecotone. Soil texture and moisture are the primary factors affecting the ecotone between sagebrush and forest communities, with lodgepole pine advancing into the sagebrush area only during the wettest years (Anderson 1994).

Aspen (Populus tremuloides), a relatively short lived tree species (80-100 years), occurs in both the riparian and upland zones. It is considered a pioneer species and is succeeded by shade tolerant and longer lived species. However, this succession is reduced with the presence of recurrent fire in aspen stands. According to Anderson (1994) there has been very little aspen reproduction in the park since the early 1900s because of fire suppression.

Exotic plant species are a serious concern in the park. According to Shaw (1992), the plant species list for Grand Teton National Park contained 88 exotics in 1976. In 1992, 117 alien species were listed, representing an increase of 33 percent. Control measures are performed to reduce the popula-

tion level of high priority exotic species, using chemical, mechanical, and biological controls. These species of highest priority include musk thistle (Carduus nutans), spotted knapweed (Centaurea maculosa), diffuse knapweed (Centaura diffusa), Canada thistle (Cirsium arvense), common tansy (Tanacetum vulgare), common mullein (Verbascum thapsus), oxeye daisy (Chrysanthemum leucanthemum), butter-n-eggs (Linaria vulgaris), houndstongue (Cynoglossum officinale), black henbone (Hyoscyamus niger), dyers woad (Isatis tinctoria), dalmation toadflax (Linaria dalmatica), leafy spurge (Euphorbia esula), and St. Johnswort (Hypericum perforatum). These species are most commonly found in the park in roadside ditches, areas grazed by cattle, and throughout the riparian zone.

A survey of exotic plants in the Snake River Bottom from the dam to the south boundary was done in 1993 (Haeker et al. 1993). In order of prevalence, the following exotics were found in the survey: Canada thistle, musk thistle, mullein, yellow toadflax, common tansy, oxeye daisy, and houndstongue.

Aquatic Invertebrates

Invertebrate productivity in the Snake River is slightly above average compared to similar rivers in the west and is an integral part of the fisheries, wildlife, and ecosystem. The aquatic invertebrate fauna is fairly complex with approximately 170 species having been collected and identified. Species diversity is much lower between Jackson Lake Dam and Pacific Creek than in areas downstream. One study showed that twenty-three major species were identified in downstream areas whereas only seven identified species exist between the dam and Pacific Creek. This may reflect fluctuating flows from dam operation, differences in substrate, and lack of niche diversity above Pacific Creek. Caddisflies (Trichoptera), mayflies (Ephemeroptera), stoneflies (Plecoptera), and true flies (Diptera) compose over 98 percent of the total biomass of invertebrates in the river. Caddisflies of the Hydropsyche and Arctopsyche genera are the most abundant group present.

Fish

The fish fauna of the upper Snake River is species poor, which is typical of intermountain cold waters. The native fish fauna includes Snake River cutthroat trout (Salmo clarki spp.), mountain whitefish (Prosopium williamsoni), Utah sucker (Catostomus ardens), bluehead sucker (C. discobolus), mountain sucker (Pantosteus platyrhynchus), bonneville redside shiner (Richardsonius balteatus), speckled dace (Rhinichthys osculus), longnose dace (R. cataractae), Utah chub (Gila atraria), leatherside chub (G. copei), mottled sculpin (Cottus bairdi), and the Paiute sculpin (C. beldingi) (Kiefling).

Presently, four non-native salmonids inhabit the upper Snake River drainage. In 1933, both brook trout (Salvelinus fontinalis) and rainbow trout (Oncorhynchus mykis) were introduced into the drainage by the Wyoming Game and Fish Department. Brook trout can be found throughout the drainage though they prefer smaller streams and beaver ponds. The few remaining wild populations of rainbow trout are infrequently found in Jenny Lake and sections of the Gros Ventre River. In 1890, both brown trout (Salmo trutta) and lake trout (Salvelinus namaycush) were introduced into two lakes in the drainage by the U.S. Fish Commission. Within a short period of time, both species drifted into Jackson Lake and other waters throughout the drainage. Now, lake trout inhabit many surrounding lakes, whereas brown trout are mostly confined to

the Snake River and Jackson Lake (Kiefling).

The Snake River cutthroat trout (Oncorhynchus clarki spp.) inhabits the river between Jackson Lake and Palisades Reservoir. The population supports an important fishery and is of considerable scientific and aesthetic value. It is thought to be a separate subspecies of the cutthroat series due to its distinct fine spotting pattern and the fact that it is well adapted to large swift streams (Kiefling). Other factors defining it as a possible separate subspecies is that it is fast growing but short lived with a high rate of natural mortality. In fact, only one pair of spawners returns for every 2,000 eggs laid (WGFD). During spawning in the spring of the year, Snake River cutthroat migrate into the tributaries. Spawning success depends highly upon the conditions of these tributaries which are easily affected by migratory blocks (beaver dams, natural cascades of water, and irrigation headgates), lack of cover, substrate size, turbidity, flooding, pollution from livestock, and lack of food production. Additionally, concerns regarding the future of the Snake River cutthroat fishery have increased in recent years due to increased water development, irrigation water demands, loss of aquatic habitat from flood control management, and greater fishing demand.(Rowan).

Fishing regulations in Grand Teton National Park are contained within the Wyoming Game and Fish state fishing regulations. The use of fish or fish eggs for bait is prohibited. Lakes closed to fishing to protect nesting waterfowl include: Christian Ponds, Hedrick's Pond, Moose Pond, Sawmill Pond and Swan Lake. Blacktail Spring Creek, Upper Bar BC Spring Creek, Lower Bar BC Spring Creek, and Cottonwood Creek downstream from the Saddle Horse concession bridge are closed to fishing from November 1 through July 31. The period from April 1 through July 31 is closed to protect spawning Snake River cutthroat trout.

The first special regulation initiated for the Snake River occurred in 1973. The creel limit on cutthroat trout between Jackson Lake Dam and the Moose Bridge was reduced to two fish. In 1986, a slot limit was initiated on the Snake River from 1,000 feet below Jackson Lake Dam to Moose. The regulation established was a limit of four trout per day with only one trout to exceed 15 inches. All trout 11 to 15 inches must be released, and fishing done with artificial flies or lures only. In 1990, the slot range was extended to protect all fish between 11 and 18 inches. This was done to protect a greater percentage of the spawning fish.

Beginning in 1996, there were two new regulations implemented on the Snake River:
1) The creel limit on the Snake River from Yellowstone National Park to the West Table boat ramp was reduced to three fish and 2) The slot limit from 1,000 feet below Jackson Lake dam to the Wilson Bridge was modified to 12 to 18 inches.

According to Annear, "management objectives of the Snake River should emphasize establishment of historic average releases or natural instantaneous inflows to the reservoir, whichever is less, as a base flow to the river." A release of 400 cfs, which is slightly less than the average winter flow, is recommended in Annear's study as the optimal minimum winter flow. A flow of 400 cfs would protect the Jackson Lake lake trout fishery, avoid conflicts with water rights, and maintain downstream fisheries at historic levels. A flow of 280 cfs was determined to be an acceptable minimum release level.

Amphibians and Reptiles

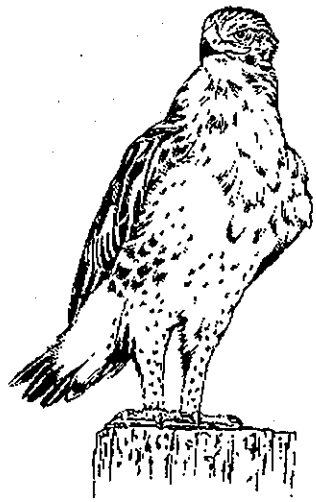
The boreal chorus frog (Pseudacris triseriata), the spotted frog (Rana pretiosa), the boreal toad (Bufo boreas), and the tiger salamander (Ambystoma tigrinum) are all native to the Snake River area. The leopard frog (Rana pipiens) has not been observed in the park since the 1950s and is believed to have been extirpated (Peterson 1992).

Boreal toads, spotted and chorus frogs inhabit Schwabacher Pond, a beaver pond adjacent to the Snake River at the upper Schwabacher Landing. In 1995, this site supported breeding populations of chorus frogs and boreal toads. Although no spotted frog egg masses were found in the immediate vicinity, a number of juvenile spotted frogs used the area, suggesting that there probably was a breeding site nearby (Baptiste 1995). Spotted and chorus frogs and boreal toads are likely to be found in similar areas throughout the Snake River corridor.

Two species of garter snakes, common (Thamnophis sirtalis) and wandering (T. elegans), inhabit the riparian and upland areas around the Snake River. The sagebrush lizard (Sceloporus graciosus) is rare in Grand Teton National Park. Only four observations of this lizard have been documented since 1965, two occurring in the Snake River upland zone (S&RM database).

Birds

According to the Grand Teton National Park Resources Management Plan (1995), there are over 300 species of birds within the park. Some of the more prominent species which use the Snake River aquatic and riparian zones for feeding, nesting, and loafing are the white pelican (Pelecanus erythrorhynchos), great blue heron (Ardea herodias), bald eagle (Haliaeetus leucocephalus), osprey (Pandion haliaetus), trumpeter swan (Cygnus buccinator), Canada goose (Branta canadensis), and sandhill crane (Grus canadensis). A variety of other raptors, waterfowl, and neotropical migrants also use the river corridor.



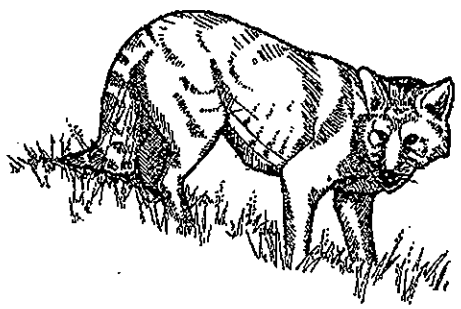
Of particular interest, in relation to the intent of this project, are the bald eagle, osprey, great blue heron, and trumpeter swan, all protected by seasonal closures on the river (Grand Teton National Park 1994, National Park Service 1994). There are six known bald eagle nests along the river corridor; all were used in 1995. Eight of the 17 known osprey nests and three of four known heron rookeries located along the river corridor were occupied in 1995 (S&RM database). Another heron rookery in the Oxbow Bend is no longer used and may have been abandoned due to human disturbance (Reid 1994). Trumpeter swans historically nested in the Oxbow Bend and Sawmill Ponds areas but presently use the river corridor only as a wintering area. It is believed that the Oxbow Bend swan nest also was abandoned due to human disturbance (Grand Teton National Park 1988). Thirty-nine swans were counted between the Jackson Lake Dam and Moose during the January, 1995 mid-winter swan survey (U.S. Fish & Wildlife Service 1995a).

A number of other birds use the riparian and upland areas for nesting, loafing, and feeding. Red-tailed hawks (Buteo jamaicensis), common ravens (Corvus corax), great-horned owls (Bubo virginianus), and

Canada geese are some of the species known to nest in the river bottom areas.

Mammals

Several of the park's 54 species of mammals use the Snake River corridor. Beaver (Castor canadensis), river otter (Lutra canadensis pacifica), and muskrat (Ondatra zibethicus) inhabit aquatic and riparian zones. Small mammals such as red-backed voles (Clethrionomys gapperi), deer mice (Peromyscus maniculatus), pocket gophers (Thomomys talpoides), squirrels (Spermophilus sp.), and chipmunks (Tamias sp.) are abundant in riparian and upland areas and provide an important food base for carnivorous mammals such as coyotes (Canis latrans), martens (Martes americana), badgers (Taxidea taxus), and weasels (Mustela sp.). Larger, more conspicuous mammals which use the riverine areas include moose (Alces alces shirasi), bison (Bison bison), elk (Cervus elaphus nelsoni), mule deer (Odocoileus hemionus hemionus), pronghorn antelope (Antilocapra americana americana), black bear (Ursus americanus cinnamomum), mountain lion (Felis concolor), and grizzly bear (Ursus arctos horribilis).



Elk, moose, and bison use the riverine areas during the summer for calving (see map). Elk and bison calve in riparian and upland areas west of the river from the Oxbow south to Burned Ridge. Elk also calve west of the river from the north end of Timbered Island south to Cottonwood Creek, and in a small area between Lake Creek (near Phelps Lake) and the Snake River.

Moose and mule deer winter in the river bottom, along with small numbers of elk and bison.

The Snake River bottom east of the river is open to elk hunting from Spread Creek south to Ditch Creek from approximately October 14 through December 3, as part of a park-wide elk reduction program (National Park Service 1995).

Rare and Endangered Species

All of the five endangered or threatened species federally listed for this area have used the Snake River corridor: the endangered peregrine falcon (Falco perigrinus) and whooping crane (Grus americana), the threatened bald eagle (Haliaeetus leucocephalus) and grizzly bear (Ursus arctos horribilis), and the gray wolf (Canis lupus), now considered experimental. As of November, 1994, all wolves within Wyoming are regarded as part of the nonessential experimental wolf population. On National Park and National Wildlife Refuge system lands however, wolves are still considered a threatened species and are fully protected under Section 7(c) of the Endangered Species Act (Fish and Wildlife Service 1995).

Peregrine falcons nest in and migrate through the park. No peregrine nests are located in the Snake River corridor, but park files contain 33 documented sightings of peregrine falcons in riparian and upland areas of the river, indicating use of the area for traveling and foraging. Observations have occurred from the early 1960s until the present in the months of April through October.

The whooping crane is expected in this area as a migrant species (U.S. Fish and Wildlife Service 1995b). From 1978 through 1995, there have been twelve documented observations of whooping cranes in the Snake River corridor. Of these, two were on the ground foraging or loafing, and seven were observed flying within the corridor. The remaining three whooping crane observation reports did not contain specific information about the birds' behavior (S&RM database).

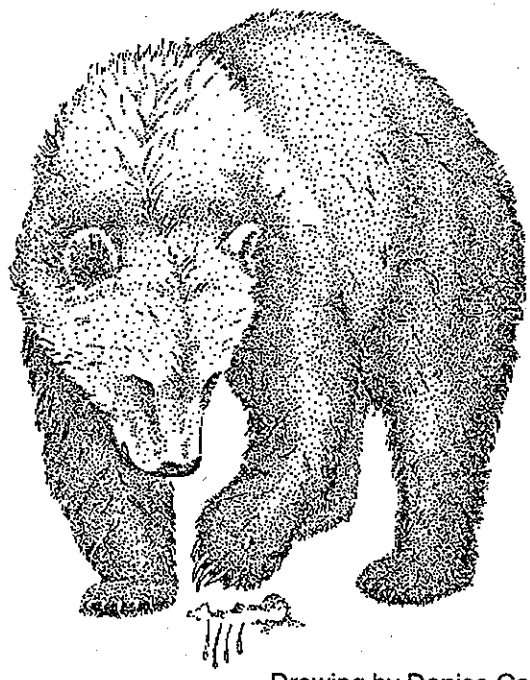
Bald eagles use the Snake River corridor throughout the year. As previously mentioned, six bald eagle pairs currently nest, feed, roost, and loaf along the river corridor.

Tracking data on grizzly bears collared by the Wyoming Game and Fish Department indicate that at least three different grizzly bears used the Snake River corridor area in 1994 and 1995 (Baptiste and Cain 1994, 1995).

Gray wolf sightings are rare in the park; in the past 20 years, there have been no verified gray wolf sightings in the Snake River corridor.

The U.S. Fish and Wildlife Service (1994) has also identified the following fourteen candidate species which may occur within the project area. All are category 2 species, which means that current available data is insufficient to support listing as endangered or threatened.

Preble's shrew (Sorex preblei)
Spotted bat (Euderma maculatum)
North American wolverine (Gulo gulo luscus)
North American lynx (Felix lynx canadensis)
Trumpeter swan (Cygnus buccinator)
Harlequin duck (Histrionicus histrionicus)



Drawing by Denise Casey

Northern goshawk (Accipiter gentilis)
Loggerhead shrike (Lanius ludovicianus)
Western boreal toad (Bufo boreas)
Spotted frog (Rana pretiosa)
Leatherside chub (Gila copei)
Jackson Lake Springsnail (Pyrgulopsis (Fontelicella or Amnicola) robusta)
Jackson Lake Snail (Helisoma (Carinifex) jacksonense)
Payson's bladderpod (Lesquerella paysonii)

A number of these candidate species are known to have used the Snake River corridor. Trumpeter swans regularly winter in the riverine areas. There have been documented sightings of wolverine, lynx, harlequin duck, northern goshawk, and loggerhead shrike in the river corridor. The boreal toad, and probably the spotted frog, breed in the Schwabacher Landing area, and are likely to breed in other areas along the river corridor.

Closures

A number of seasonal closures and public use limits are in effect along the Snake River (National Park Service 1994). These include the following areas:

- From December 15 to April 1, the Snake River floodplain from the Buffalo fork downstream to Menors Ferry crossing north of the Moose development, is closed to all public use for protection of wildlife during critical wintering or nesting periods.

- To protect bald eagles during nesting and fledging periods, all lands within 1/2 mile of all bald eagle nests are closed from February 1 to August 15, when posted.

- All lands within 250 yards of nesting sites of osprey, trumpeter swan, and great blue heron are closed from February 1 to August 20, when posted, to protect birds during nesting.

- Cottonwood Creek is closed to fishing from November 1 to August 1 from the outlet of Jenny Lake to its confluence with the Snake River.

- The Snake River for 150 feet below the downstream face of the Jackson Lake Dam is closed to fishing year-round.

CULTURAL RESOURCES

Cultural Resources Overview

People have used the Snake River Corridor since prehistoric times. Archeological surveys along the floodplain below the dam have been limited, although reconnaissance surveys have been completed for most of the corridor. Wright (1974) found no evidence of prehistoric man in an area north of Moose where a new sewage treatment plant was under construction. Love (1972) hypothesized that the Snake River was a barrier to travel from east to west for the prehistoric inhabitants of the valley. The archeological base maps from 1990 confirm this, as few archeological sites have been located in the area immediately west or east of the river, between Ditch Creek and Spread Creek. Most of the existing archeological sites near the floodplain are located to the east on terraces set back from the river. It is likely that regular channel changes would displace or destroy archeological material on the floodplain. Prehistoric campsites around lakes and the Snake River delta area above Jackson Lake provide the largest source of information concerning prehistoric life in Jackson Hole. Further archeological surveys will continue

to investigate and document the prehistoric cultural resources in the Snake River corridor.

Europeans first entered the valley to trade fur in the early 1800's. Undoubtedly, some individuals trapped beaver along the Snake River. Government expeditions and miners visited the valley during the period between 1850 and 1880. The first permanent Jackson Hole settlers arrived in 1884. Extensive prospecting occurred on the floodplain during 1880 to 1900. A number of placer claims were filed—mostly near Pacific Creek, Spread Creek, and Deadman's Bar. Evidence of old placer mining activity is most conspicuous in the Deadman's Bar area. None of the claims were patented and the area was withdrawn from mineral entry when the Monument was established in 1943.

The Snake River Corridor encompasses six areas which contain historic buildings and structures. The National Park Service is currently surveying and evaluating the extant historic resources of Grand Teton National Park to determine which resources are eligible for inclusion in the National Register of Historic Places. This formal determination of eligibility process should be completed in 1997. The extant cultural resources near the Snake River are primarily early 20th century tourist-oriented facilities. Although there were homesteads and working ranches in the area, traces of these operations have been removed by the National Park Service.

Park Policy Regarding Historic Sites in Riparian Zones

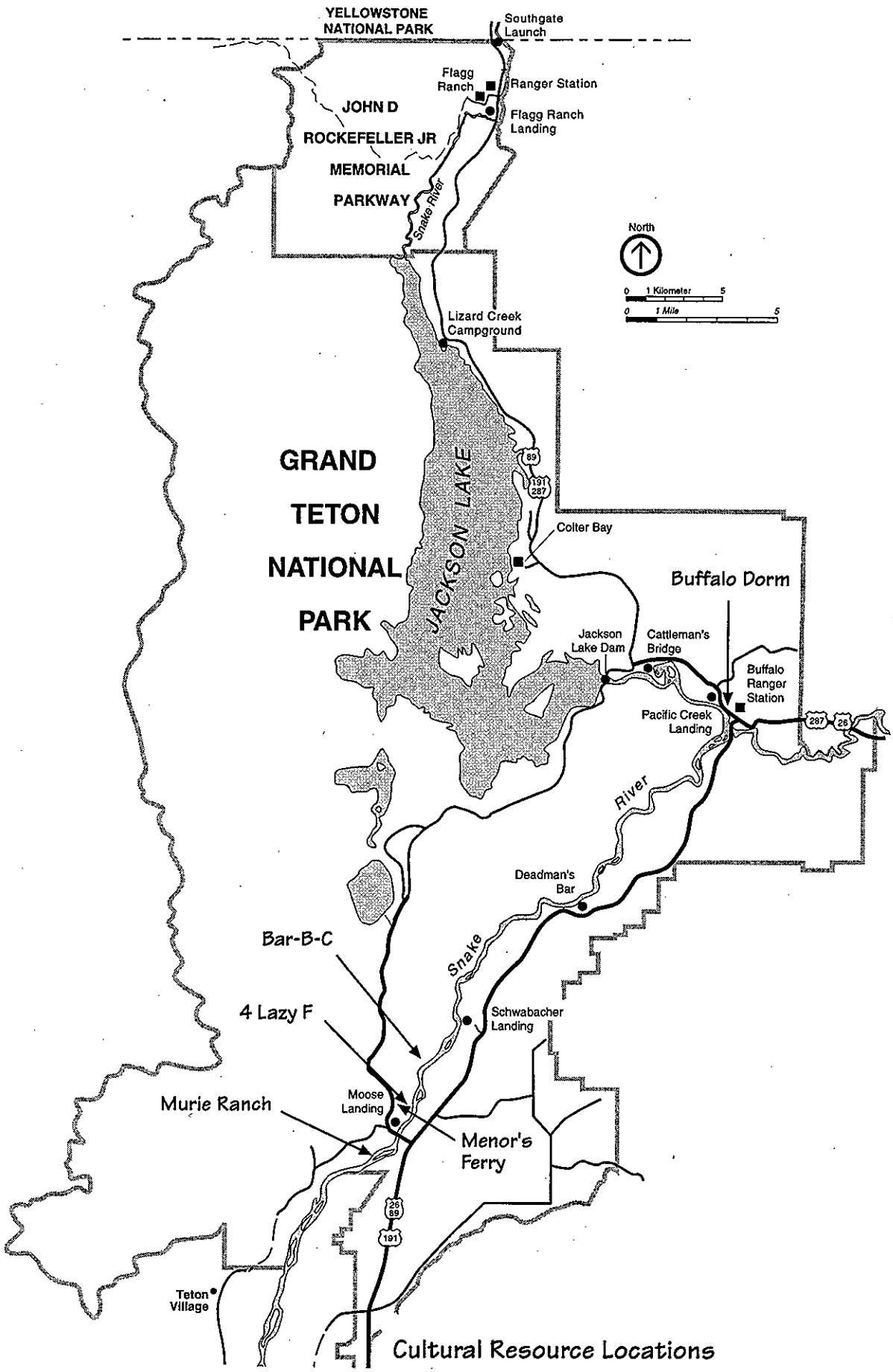
The legal mandates for management of cultural resources in the Snake River Corridor are specified in the NPS Floodplain Management and Wetland Protection Guidelines of 1980. These guidelines specify procedures to avoid long and short term adverse impacts associated with occupancy and modifications of floodplains. The guidelines also specify how to prevent direct or indirect support of development in floodplain. Grand Teton National Park has implemented policy and procedures to insure this mandate is carried out. Under these guidelines, cultural resources may be preserved in their natural and historic setting if the site possesses exceptional significance and is eligible for inclusion in the National Register of Historic Places.

Six Historic Sites in the Snake River Corridor

There are six areas with extant historic resources in the Snake River Corridor in Grand Teton National Park that are potentially eligible or already listed on the National register of Historic Places. The park will be preparing a cultural resource managment plan in the future to adress these properties in greater detail.

Cattlemans Bridge: Located in the Oxbow Bend area, Cattlemans Bridge has not been formally evaluated for the National Register of Historic Places. Constructed by the Potholes Grazing Association in the 1940s, the bridge is no longer utilized or maintained by that organization, as grazing has been discontinued in this area of the park. The bridge is in bad shape but continues to be used by fishermen and other visitors.

Hogan's Fox Farm (The Buffalo Dorm): This site, located near the Buffalo Entrance Station, is a group of four log structures that was originally a homestead but in 1926 was developed into a small dude ranch by John Hogan. Hogan built the large lodge building and three cabins to house up to twelve guests. The property was purchased by the


YELLOWSTONE NATIONAL PARK
Southgate Launch
Flagg Ranch
Ranger Station
JOHN D ROCKEFELLER JR MEMORIAL PARKWAY
Flagg Ranch Landing
Snake River
North
0 1 Kilometer 5
0 1 Mile 5
Lizard Creek Campground
GRAND TETON NATIONAL PARK
JACKSON LAKE
89
191
287
Colter Bay
Buffalo Dorm
Jackson Lake Dam
Cattleman's Bridge
Buffalo Ranger Station
Pacific Creek Landing
287
26
River
Deadman's Bar
Bar-B-C
Snake
4 Lazy F
Schwabacher Landing
Murie Ranch
Moose Landing
Menor's Ferry
26
89
191
Teton Village
Cultural Resource Locations

Snake River Land Company in the 1930's. The property was used until three years ago as seasonal employee housing, but due to building code violations, now sits vacant . The National Register significance of this property is currently being determined. Preliminary findings indicate that the lodge building, which served as the main house, may be eligible under the criterion for architecture. The site may also be eligible for its association with the Rockefeller financed Snake River Land Company. Preliminary historical research indicates this property was used as an administrative site by the Rockefeller organization. Any proposed treatment of the site must wait until the fall of 1996 when a complete site history and formal determination of eligibility is completed

The Bar-B-C Dude Ranch: The Bar-B-C is arguably the most famous of the Jackson Hole dude ranches, in large part due to the efforts of Struthers and Katherine Burt, the original ranch owners. Katherine Burt had influence in the early development of Hollywood western films and was instrumental in bringing Hollywood film makers to Jackson Hole. Struthers Burt was a writer who wrote stories in many national publications to lobby for the creation of Grand Teton National Park. Struthers was also a novelist,whose most notable book, *Diary of a Dude Wrangler,* documented his experiences at the Bar-B-C. The 1990 Teton Corridor Development Concept Plan determined that,the issue of treatment of the Bar-B-C would be determined by the results of an Historic Structures Report (HSR). The recently completed HSR strongly recommended retention of the property and proposed an extensive and complete restoration of the ranch. The high cost associated with this plan, among other factors, make that recommendation not feasible. A site plan adressing the future of this site will be prepared as part of the cultural resource management plan.

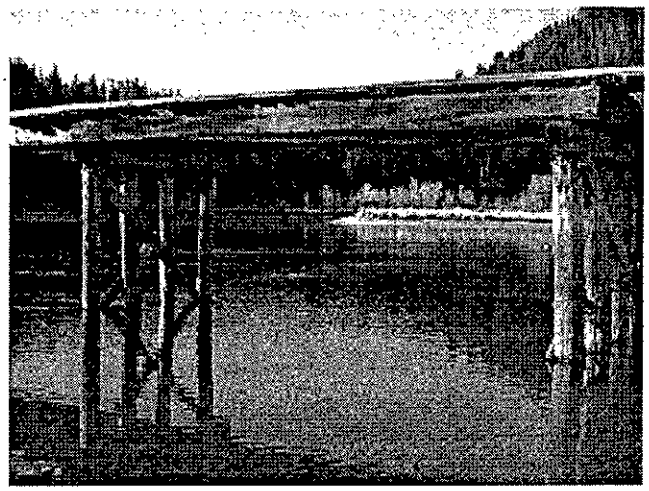
The Four Lazy F Dude Ranch: This ranch, located on the Snake one mile north of Moose, was started by the Frew family, former patrons of the Bar-B-C, who decided to create their own semi-private dude ranch. This property is a life estate that will eventually revert to full NPS management. It is the best preserved of the early dude ranches and the only one still operating on the west bank of the Snake.

Menor's Ferry: This complex, which includes the Maude Noble Cabin, is the only historic site in Grand Teton National Park actively staffed and operated for public use and enjoyment. During the summer months, a replicated ferry is operated on the river and period merchandise is sold in the store. Menor's Ferry is located adjacent to the Snake River near Moose, a developed area. Menor's Ferry is a significant representation of early homesteading and the transportation frontier in Jackson Hole. Bill Menor was the first homesteader on the east bank of the Snake River north of Jackson in 1894, where he established a small store and ferry operation. The Snake River was a barrier to crossing, and therefore to settlement on the east side of the river, until Menor built his ferry. In 1918, Menor sold the operation to Maude Noble and a Mr. Sandell. (Two different first names have been found in the literature.) Maud Noble's cabin on Cottonwood Creek was moved to its present location in 1918. She operated the ferry until 1927, when a steel truss bridge was built across the river. Noble sold the 149 acre property to the Snake River Land Company in 1929. In 1949, the Jackson Hole Preserve Inc., under the sponsorship of J.D. Rockefeller Jr., restored Bill Menor's cabin and reconstructed the ferry. The property was turned over to the National Park Ser-

vice in 1953, and placed on the National Register of Historic Places in 1969.

Bill Menor's cabin is the most significant building within the compound, as it is one of the oldest structures in the park. The cabin functioned as ferry office, store, and residence. Original structures on the site include Menor's cabin, two associated utility buildings and the Maud Noble Cabin. Reconstructed facilities include an outhouse, a wellhead, the cableworks, and the ferry. The museum and transportation shed were probably built in the 1950s by the Snake River Land Company for interpretive purposes (Carson 1964). A small log cabin moved from another location in the late 1940's was developed into a small museum. The museum houses an eclectic collection, including a "bull boat" fashioned from buffalo hides and a dog sled. A variety of freight wagons, passenger coaches, carriages and other vehicles are displayed in the transportation shed. An archaeological survey was completed on this site in 1990, with no significant findings. Located in the Menor's Ferry area, the *Chapel of the Transfiguration* is a private inholding, listed on the National Register of Historic Places in 1980s. The building is owned by the Episcopal Church. Church services are conducted there in the summer. This document proposes no changes to the status or use of this property.

The Murie Ranch: This ranch was listed on the National Register of Historic Places in 1988. However, only the residence and studio associated with Olaus Murie were considered significant in that nomination form. The National Register nomination form is currently under revision to include the significant roles of Margaret Murie and Adolph Murie, the wife and brother of Olaus. The use of the cabins by the founders of the Wilderness Society which was headquartered at the ranch could now also be considered significant. A preliminary proposal for the development of a "wilderness research institute" to honor the Muries and their wilderness ideals is being developed in cooperation with the Teton Science School. Since the ranch is a life estate and still the property of the Murie family, this document proposes no changes to the status or use of the property. Further discussion and planning for the property will follow a long term schedule in cooperation with the Teton Science School and the Murie family.



RECREATION USE PATTERNS AND TRENDS

Type of Use

Commercial river rafting accounts for the majority of recreational use on the Snake River. Non-commercial rafting, guided fishermen, private fishermen, kayakers and canoeists also travel the river. There are 16 commercial operators authorized to provide scenic float trips and/or guided fishing trips on the Snake River. Currently, there are no limits on numbers of guided fishing trips and existing limits on commercial float trips permit an approximate 48% increase over average 1995 levels.

The commercial floating season corresponds with the summer visitor season in Grand Teton National Park. The highest use occurs between June 20 and August 20 and declines after Labor Day. Although there have been recent increases in visitation during the months of May, September and October in the park, inclement weather and low water at these times tend to restrict commercial float trips. Approximately 20% of visitors during 1995 floated the river during these off months.

Recreation Uses other than river floating

Other recreational uses that occur within the Snake River Corridor include: fishing and hiking along the banks, bird watching, driving or biking the RKO road, exploring the Bar BC Ranch, viewing wildlife and scenery from the Oxbow turnout or other road-side pulloffs, and creating artwork such as painting. These types of recreation comprise a smaller percentage of use and impact than actually floating or fishing on the river itself.

No hiking trails are maintained by Grand Teton National Park on the Snake River floodplain. Most hiking originates from the various road access areas and occurs along existing game or horse trails and abandoned roads. Although no estimates have been made, hiking activity in the area does not appear to be extensive.

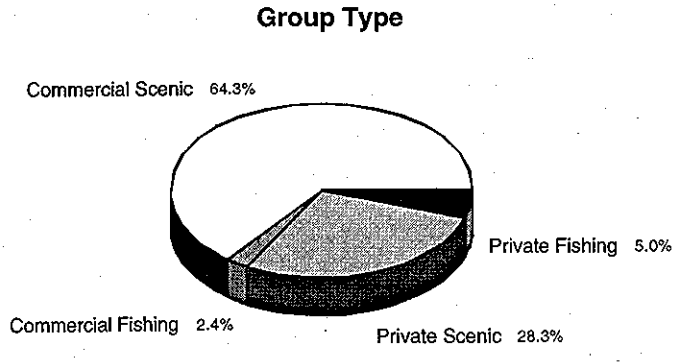
Picnicking is permitted along the floodplain, but no developed public picnic areas exist. Probably for this reason, public use is not extensive. There are two designated commercial meal sites at Deadmans Bar and one at Schwabacker which are used exclusively by float trip concessionaires. A developed picnic site exists on the floodplain west of Triangle X Ranch which is used by ranch guests. Another developed picnic site is located near Cattlemans Bridge which is used by the Grand Teton Lodge Company.

Three scenic turnouts located along the outside park road east of the Snake River receive considerable use during the summer by motorists who stop to look at and photograph the mountains to the west. The Snake River floodplain is in the foreground of this view.

Horseback riding near the Snake River originates primarily from Moosehead, Triangle X and Lost Creek dude ranches. Most riding occurs by guests in the vicinity of these three ranches.

Commercial vs. Non-Commercial River Trips

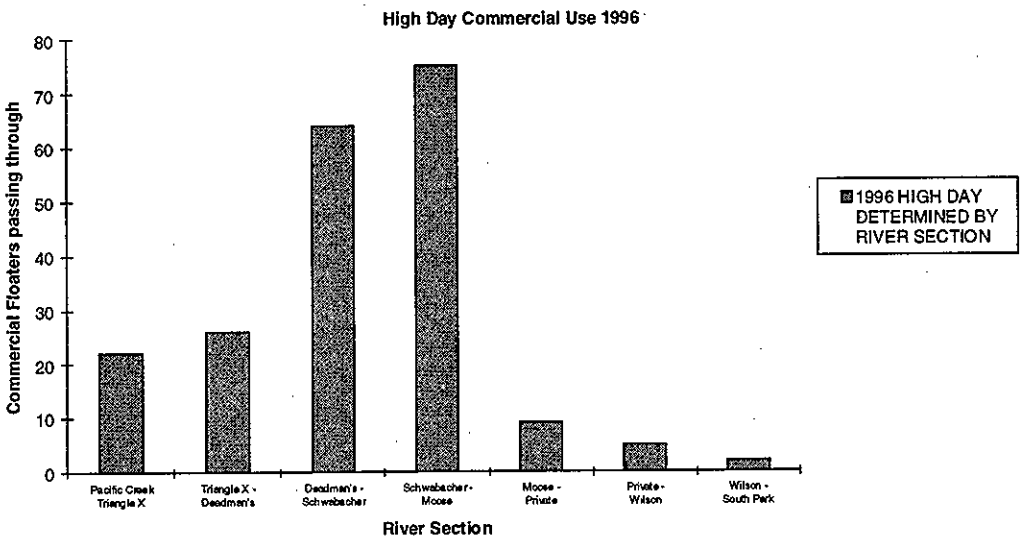
River recreationists can be divided into two distinct user groups: commercial and non-commercial. Commercial users are paying guests on a guided trip. Non-commercial users are individuals who have the skill to undertake their own river trip. Slightly more than 67% of the river users in 1995 were on commercial trips. The remaining were non-commercial visitors. Of all river users, 64% were on commercial scenic float trips while 2.4% were on commercial fishing trips.



Commercial Scenic Floating

The number of people floating the Snake River with one of the commercial outfitters has generally increased throughout the years. Since 1985, this use has increased over 39%.

Most float trips originate either at the Pacific Creek launch area or at the Deadmans Bar launch area, terminating either at Deadmans Bar or at Moose landing. Over 60% of the commercial scenic trips float the Deadmans Bar to Moose Section, while only 20% of the commercial scenic trips float Pacific Creek to Deadmans Bar. The distance of these trips varies from four to twenty miles, and the duration varies from slightly over one to six hours. There are currently 101 launches per day permitted from Pacific Creek Landing to Moose. There are 3 permitted launches per day from Moose to the Wilson Bridge. See appendix one for the current commercial operating guidelines.

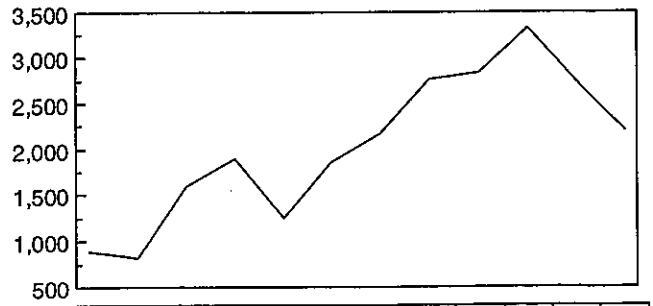


Guided Fishing

The cutthroat trout population inhabiting the Snake River supports an important sport fishery. The population is maintained by natural reproduction, and no stocking of the river in the park is presently done. The trout fishing season runs from April 1 through October 31. Most fishing activity occurs when water flows and turbidities decline after the annual run-off, usually in late July or early August. Wyoming fishing regulations and license requirements apply within the park.

Commercial fishing outfitters have seen over a 230% increase in clients over the past 10 years. However use over the last two years has declined slightly. There are currently 13 fishing permitees who have unlimited use.

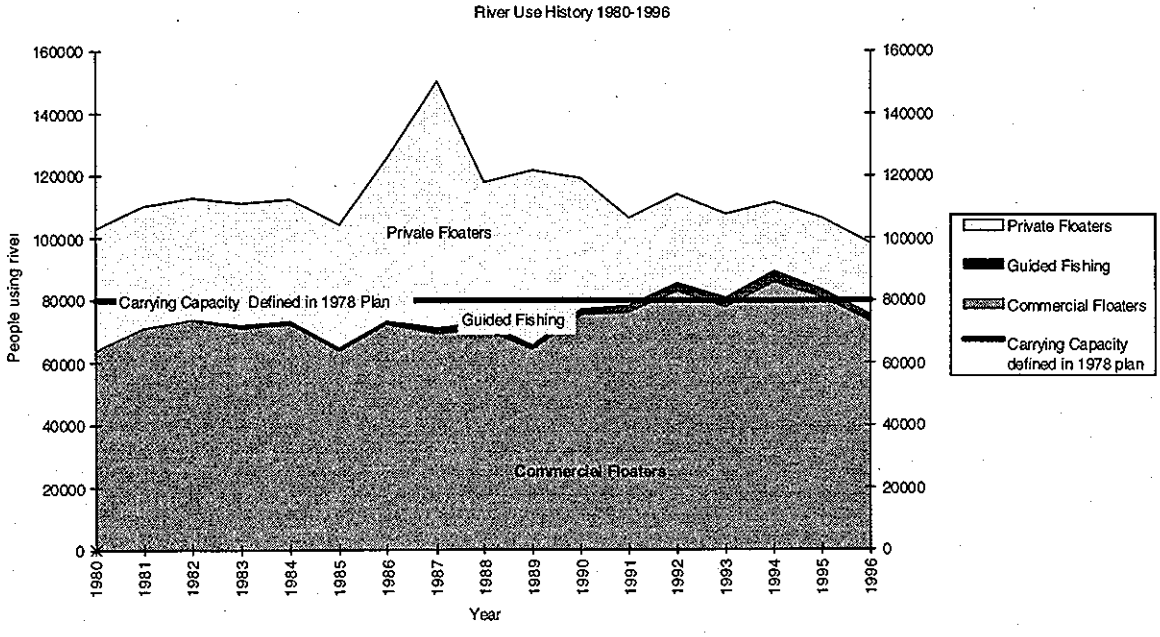
Snake River Guided Fishing Statistics
1985-1996



	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Guided Fishing	891	815	1,596	1,900	1,241	1,852	2,166	2,758	2,834	3,326	2,737	2,192

Growth in Use

The popularity of scenic float trips on the Snake River in Grand Teton National Park has increased in the last decade. Between 1985 and 1995, total annual float trip use (expressed as numbers of people participating) in the 25-mile section of the river between Jackson and Moose increased 6.8% (It should be noted that beginning in 1990, private float trips were counted using a voluntary trip permit system and it is estimated that only half of private floaters actually register). The greatest increase in overall float trip use occurred in 1987 at 44%. Since 1985, commercial scenic float trips have increased 39% and guided fishing trips have increased 230%, though use has declined slightly over the last two seasons.



VISITOR SURVEY RESULTS

This section presents a summary of the results of visitor surveys conducted during the summers of 1990 and 1995. The purpose of these surveys was to obtain background information about visitors who use the Snake River and information regarding visitor expectations and perceptions about crowding on the river.

Summary of Results From the 1995 Visitor Survey

A random survey of river users was conducted during the summer of 1995. Over a three month period from June through August, 211 visitors were surveyed. Following is a summary of survey results.

Crowding and Other Conflicts

An issue identified early in this planning process was the need to evaluate appropriate river use levels. Specifically, it was deemed necessary to examine the perception that while the river may become crowded in the future, present levels of use are acceptable. The survey needed to either verify the accuracy of this perception, or to find out if present use levels are unacceptable.

To establish a reference point for a visitor's general perception of crowding, a number of park areas were presented on the survey for evaluation. Visitors were asked to assess an area based on the traditional letter grading system, with an A+ symbolizing the least crowded or most favorable, and an F- symbolizing the most crowded or least favorable.

For analysis, these letter grades were assigned values from 1 to 15 with A+ having a value of 15, B+ a value of 12, C+ a value of 9, D+ a value of 6 and F+ a value of 3.

Figure 1: Grade the Park for Crowding

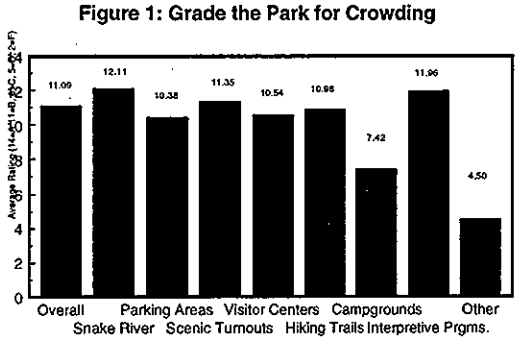
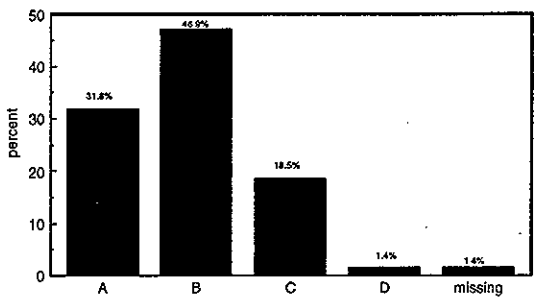


Figure 1 shows that overall, visitors gave the park a "B" for crowding. Different areas within the park received different grades. The majority of visitors, 92%, gave the Snake River a "B+". This was the highest score given on this section of the survey. Campgrounds received the lowest scores; 34% of the visitors gave them a "C-", while 26% gave the campgrounds an "F".

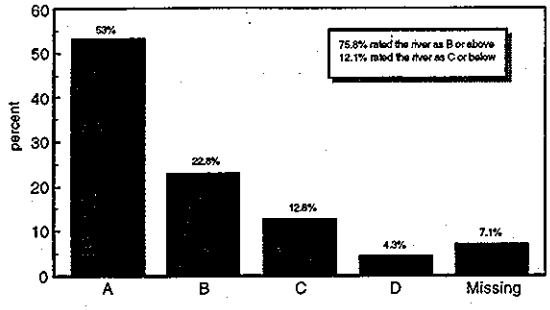
Figure 2 shows a summary of perceived crowding in all of the park areas combined. Overall 31.8% of the visitors gave the park an "A" average, with the majority of visitors giving the park a "B" average.

Figure 2: Overall Crowdedness Evaluation



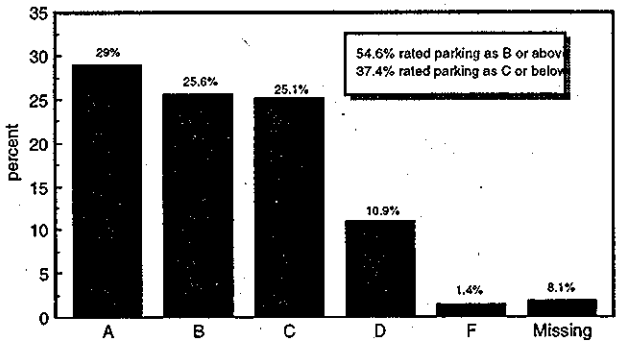
When the Snake River was analyzed separately from other areas within the park, over 53% of the responses gave the Snake River an "A", with over 75% at a "B" or above as shown in figure 3. The river was rated by 17.1% as a "C" or below.

Figure 3: Snake River Crowding



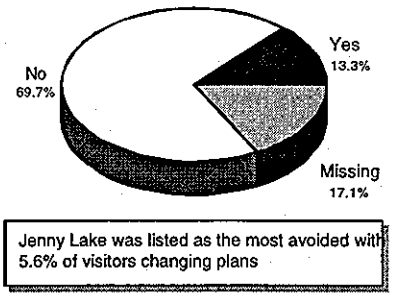
During public meetings regarding the Snake River Management plan, parking congestion was identified as an issue. Figure 4 shows a summary of public response concerning parking area crowding, indicating that responses were evenly divided on this question. Over 54.6% rated parking a "B" or higher, while 37.4% rated it a "C" or lower.

Figure 4: Parking Area Crowding



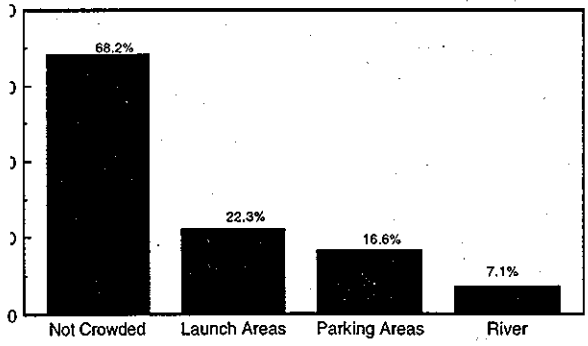
The survey asked visitors if they had changed their plans because of crowded conditions in the park, and if so, where the crowding had occurred. Figure 5 shows that over 69% stated they did not, while 13.3% did. The Jenny Lake area was the most frequently mentioned with 5.6% changing their plans to visit that area because of crowded conditions.

Figure 5: Change Plans due to Crowding



Visitors were next asked if they felt that any areas of the river were crowded, if so which ones, and if that crowding affected their trip. The results described in figure 6 show that almost 70% rated the river as not crowded. Launch areas were mentioned by 22% as crowded, followed by parking areas mentioned by 16%. Only 7% mentioned the river itself as being crowded.

Figure 6: Rate Crowding

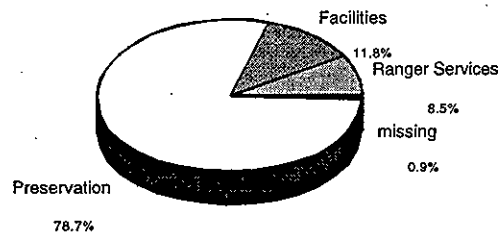


Emphasis for Future Planning

To assist park management in determining what the park should emphasize in planning for the river corridor, visitors were asked to rate, in order of preference, facility development, ranger services and preservation. Figure 7 shows

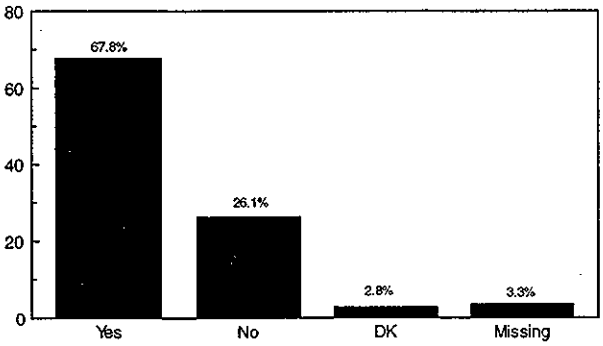
preservation is the number one priority the public believes the park should emphasize in its preparation for the future.

Figure 7: Emphasis for the Future



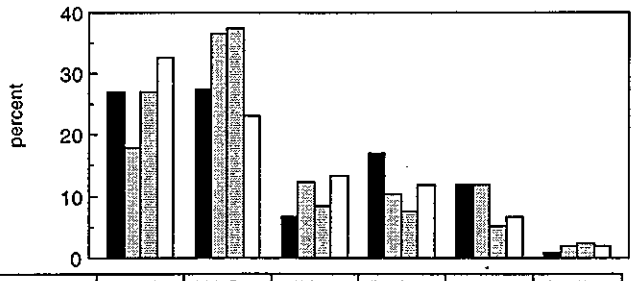
While the majority of visitors felt current river use levels are acceptable, this planning process will determine future use of the river. Visitors were asked if future restrictions on their use of the river would be acceptable to create less crowded conditions. Figure 8 shows visitors overwhelmingly supported future restrictions on their own use to create less crowded conditions, with almost 70% responding yes.

Figure 8 : Support Future Restrictions to Reduce Crowding



A follow-up question asked visitors to specifically rate potential control measures. The majority supported all measures. User fees were the most disliked, with 17% mildly opposing additional user fees. Figure 9 shows the summary of results for this question.

Figure 9: Crowd Reducing Alternatives



	Strongly Favor	Mildly Favor	Neither	Mildly Oppose	Strongly Oppose	Don't Know
Additional User Fee	27.0	27.5	6.6	17.1	11.8	0.9
Quotas	18.0	36.5	12.3	10.4	11.8	1.9
Permit System	27.0	37.4	8.5	7.6	5.2	2.4
Limit Future Facilities	32.7	23.2	13.3	11.8	6.6	1.9

Note: #'s are percents

Visitor Characteristics

One intent of this visitor survey was to understand the characteristics of visitors who use the river. The average age of river users is 45 years old. Half of those surveyed were from 37 to 54 years of age. Eighteen percent of the visitors surveyed were from Jackson, Wyoming. Wyoming residents accounted for 23% of the sample. The mountain states census region added up to 42% and Californians represented 11% of the users. All regions throughout the United States were represented to some extent. The majority of visitors were using the river for the first time and 37% rated their floating and fishing skill level as novice.

Figure 10: Number of Trips as a Passenger

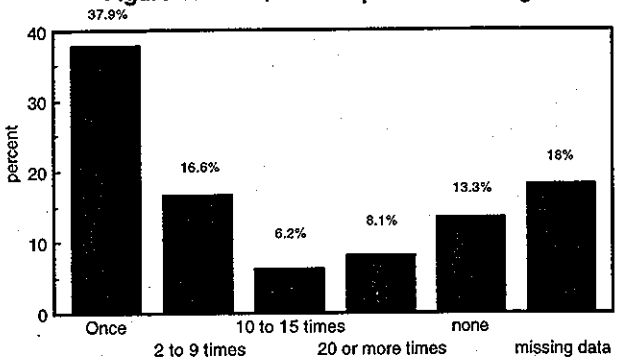
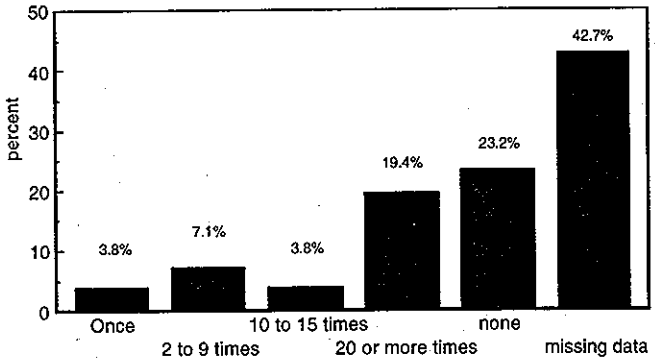


Figure 11: Skill Level

	novice	intermediate	Expert	missing
floating	45.0	26.5	18.0	10.4
fishing	41.7	24.2	10.4	23.7

Note: #'s are percent's

Figure 12: Number of Trips as a Oarsman



Summary of Results From the 1990 Visitor Survey

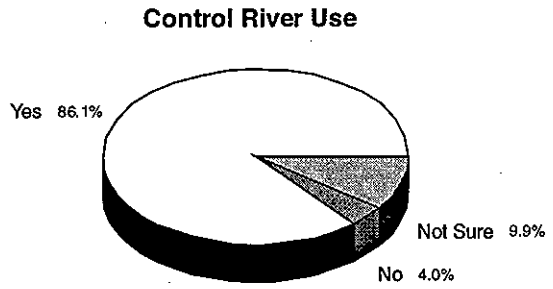
A survey was conducted in the summer of 1990 by personnel of the Cooperative Park Studies Unit, from the graduate school of the City University of New York. The survey was conducted over a five day period in late July, 1990. Visitors were randomly contacted at locations designated by Grand Teton National Park managers. The interviews were conducted at landings along the Snake River, at the Gros Ventre campground, the Moose Visitor Center and Jenny Lake.

Interviewers stopped 263 visitors during the survey period and completed 241 interviews, a response rate of 92%.

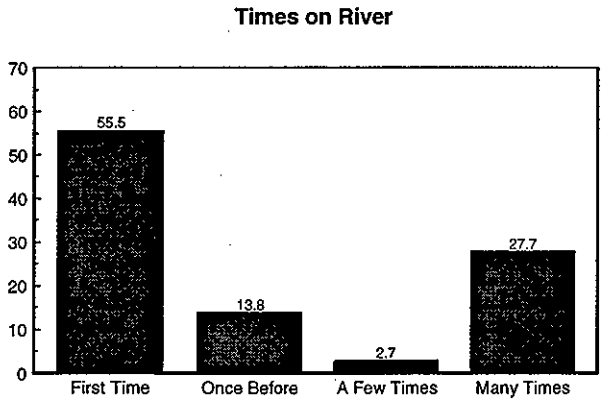
The responses to several of those questions can be compared to results from the 1995 survey. Specifically, visitors in 1990 were asked the following question concerning control of future use:

"The growing popularity of Snake River fishing and floating trips means Grand Teton National Park must consider ways to protect the quality of the wildlife and other resources as well as the quality of the visitor experience. What are your feelings about controls over Snake River traffic inside the National Park? (Such as limiting the number of commercial fishing trips; mandatory permits; limits on floats on some sections of the river.)

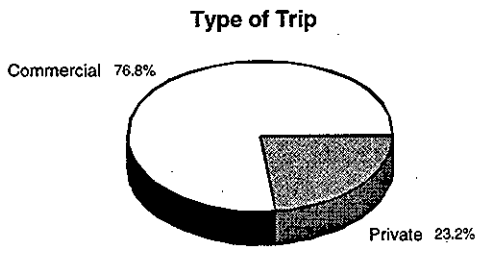
Over 86% of the visitors surveyed in 1990 supported future controls as compared with 67% in 1995.



Visitors were also asked how many times they had floated the river. Over 55% were on their first trip in 1990 as compared to 37% on their first trip in 1995.



Data was also gathered concerning type of trip. Over 76% of the visitors were on commercial trips as compared with 66.7% in 1995.



EXISTING ACCESS AREAS

There are six areas between Jackson Lake Dam and Moose that provide easy access to the Snake River. Visible impact to vegetation has occurred in all these areas. Vegetation is rapidly eliminated by vehicles where no control of traffic or well-designated roads exist. Heavy pedestrian traffic has also resulted in loss of vegetation in some areas. The following describes the existing conditions of these sites.

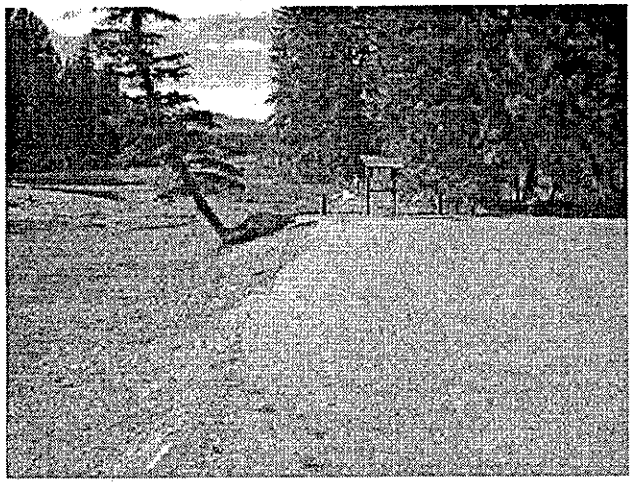
Jackson Lake Dam Area

After reconstruction of the Jackson Lake Dam in the late 80's the access to the area was redesigned, providing direct vehicle access to the north side of the river. A 27 car parking and picnic area was developed and was intended to provide fisherman access to the dam area with the parking area adjacent to the river removed. Since that parking area was never removed the majority of fisherman and users of the area park along side the river. On the south side of the river, vehicular access was removed with pedestrian access provided from a parking area adjacent to the south side of the dam.

Visitor use in this area is intensive—most occurring within 2000 feet of the dam. Angler use has averaged over 10,000 days annually since 1980 and boat launchings average about 1,200 per season. Considerable traffic by motorists for sightseeing purposes also occurs. This area is the most heavily used and congested along the river. Motorists often park in the launch area, blocking access to the river for those wanting to put-in. The area immediately adjacent to the river is completely devoid of vegetation and the numbers of cars are very visible to those traveling along the park road.

Pacific Creek

A paved road, boat launching site and parking area are provided at Pacific Creek. Approximately 14 commercial scenic boats per day are launched at this site, or 20% of the commercial operations. The layout of the launch area works well; however there is erosion occurring on the steep bank by the launch area, and the asphalt is beginning to unravel. Problems with launching occur when water levels decrease due to gravel build up. Periodic removal of small amounts of gravel has been done by the park periodically to maintain an adequate launch area.

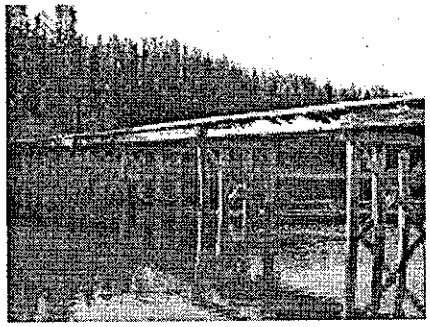


Pacific Creek Launch

Cattlemans Bridge

An unmarked dirt road provides access to the cattleman's bridge area. This primitive area provides access to the river primarily for fisherman and sightseers. Some boat launching does occur, by mainly by canoeists using the Oxbow bend area. There is limited sight distance at the junction of the access road and the main highway.

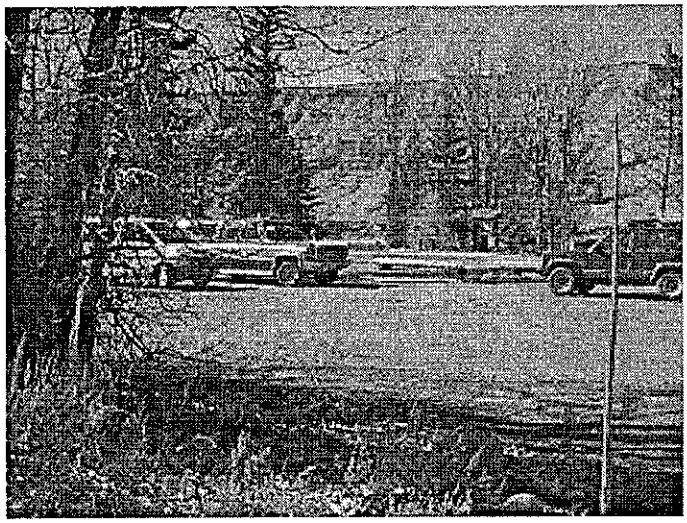
Cattlemans Bridge



Deadmans Bar

Vehicle access is by a narrow, steep and partially paved road about 0.7 miles long. An average of 41 commercial boats launched per day during the 1995 season. Parking is often confusing and disorganized as well as congested. As at Pacific Creek, during low water gravel often builds up impeding launching. There are two vault toilets at this site that often have long lines when commercial operations bring large numbers of clients at once.

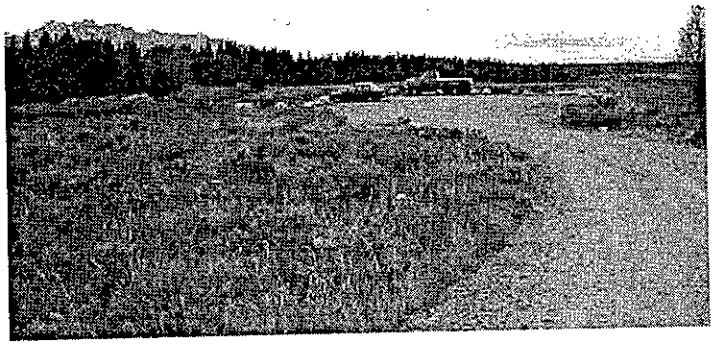
There are two meal sites adjacent to the launch area, one used by the Boy Scouts and one used by the Grand Teton Lodge Company.



Deadmans Bar

Lower Schwabacher

Access to Lower Schwabacher is by a 1.1 mile gravel road which becomes very dusty in mid-summer. The parking and launching areas are not paved, but are delineated by large boulders. The area is used primarily as a boat launching site and for fishing access. Other visitors also occasionally use the site.

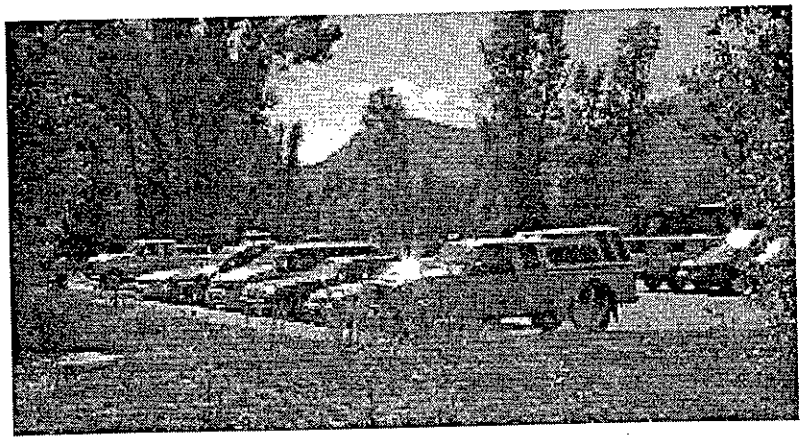


Schwabacher Landing

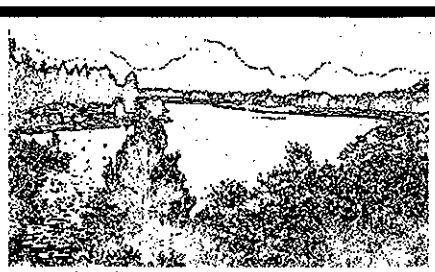
Moose

The Moose access are is located east of, and adjacent to, Grand Teton National Park headquarters. Most float trips terminate here and use is intensive. Several commercial scenic operators meet their clients here.

Moose Landing



PART FOUR, MANAGEMENT PLAN



"Silver, brilliant in evening light, the river master surfaced, rolled forward like a diminutive dolphin, and disappeared forever from my sight. A brief acquaintance, the fish was there and gone in one plunging instant." Tim Palmer, Lifelines - the case for river conservation

PART FOUR, MANAGEMENT PLAN

This section groups the values, concerns, and wishes expressed by the public, NPS staff, and other government agencies into a set of preferred conditions, and outlines the management plan for the river.

Desired Future Conditions

The conditions listed below form the foundation of the Snake River Management Plan, building upon the goals set forth in Grand Teton National Park's General Management Plan, Statement for Management, and public input. These conditions will serve as the reference point for all programs and activities the NPS will undertake within the river corridor; they establish the standard for resource conditions. The park will be preparing a cultural resource managment plan in the future to adress those resources in greater detail. The success of this plan can, therefore, be measured by the extent to which it fulfills the following objectives for natural resources, recreational experience, outfitting and public access and launch sites:

Natural Resources

- The natural functions of plants and animals, as they relate to the Snake River, are preserved and enhanced.
- There is adequate baseline data available upon which to make sound management decisions.
- Wildlife habitat for threatened, endangered, and sensitive species is identified and protected.
- Deer, elk, moose, otter, beaver, osprey, waterfowl, raptors, amphibians, and a variety of songbirds can be observed in their natural environments.
- The bald eagle population is not adversely affected by river use.
- The fishery in the river is stable and thriving.
- The effects of the dam and water flow on the river system are understood and controlled to protect both the natural resources as well as the recreational experience in the river system.
- Water quality is regularly monitored and remains high.

Recreational Experience

- Recreation opportunities such as scenic floating and fishing are provided for within the Snake River Corridor, where consistent with natural resource preservation.

- A variety of options are available to float the river: private boats, commercial tours, rental boats, and guided fishing.

- All private users are aware of river conditions and the skills required to safely complete the float.

Outfitting

- Commercial trips are planned to avoid congestion at launch sites.

- Outfitters share river use responsibly, and help clients gain a better appreciation of river resources and ethics through educational and instructional trips.

- There is no illegal outfitting.

Launch Sites

- Launch sites are organized, with adequate parking and launch facilities. The sites are uncongested but not overdeveloped.

Existing Guidelines

There are a number of guidelines which are presently, and will continue to be, in effect. These guidelines include:

- Existing closures to protect wintering and nesting wildlife

- On-going wildlife monitoring efforts

- Safety regulations and licenses, for river users

- Yearly boat registration for non-commercial river users

- Operational and administrative requirements for commercial boating and fishing companies

- Commercial use permits and regulations are in effect anytime the river is open to the public

- Routine maintenance, such as garbage collection and maintenance of privies, roads, and launch areas

- All law enforcement regulations such as prohibitions on off-road driving and overnight camping

- Required actions outlined in other park management plans, such as the Human/Bear Management Plan, the Grazing Management Plan, or the Natural Resources Management Plan

- No motorized craft allowed on the river

- Equipment requirements continue for commercial operators (refer to appendix one for a complete description of minimum equipment requirements);

- A commercial shuttle service may be available for private river users

- Commercial operators will continue to offer a variety of lengths of trips covering different sections of the river

Management Plan

The National Park Service developed this final Snake River Management Plan as a result of comments and input received on the Draft Snake River Management Plan released in August of 1996, and the Snake River Management Plan/Environmental Assessment released in April 1997. This Snake River Management Plan is scheduled to begin implementation during the summer of 1999.

Public comment throughout this planning process generally reflected a desire to see future use levels on the river remain consistent with existing levels.

After release of the Draft Snake River Plan in August of 1996, many of the commercial outfitters asked that a simple average of use not be applied to determine launch numbers, since use varies widely depending on user demand, weather, and time of the week, as well as time of the season. In response to that request, the preferred alternative presented in the Snake River Management Plan/Environmental Assessment in April 1997 proposed to cap use at existing levels, with commercial float and fishing use caps set in a way that provide some flexibility for fluctuating demand. Several comments received on the April 1997 draft felt that the system proposed of daily caps in addition to monthly caps was going to be difficult to manage. Several other comments from commercial operators requested that the current reserve allotment system remain in effect. Other comments reflected the desire to see the no-action alternative implemented, no parking restrictions at launch areas and improvements to the launch areas developed. Some commercial outfitters felt that they were regulated enough and that private users should be regulated more stringently.

Several public comments were made requesting additional opportunities for commercial guided fishing on Jackson Lake. Grand Teton Lodge Company and Signal Mountain Lodge currently hold permits to offer guided fishing on Jackson Lake. The Lodge Company has the contractual right to provide any additional fishing services on the park's lakes, if the park were to authorize them.

In addition, several public comments were made requesting additional commercial fishing use of the Moose to Wilson section, which flows within park boundaries for the first three miles. The Bureau of Land Management owns the Wilson launch and takeout site. This section is open to all commercial fishing outfits currently permitted by the park. Grand Teton National Park administers all commercial activity which takes place within the park, even if those activities extend beyond its boundaries. The park will continue to authorize permits for commercial use of the Snake River from Moose to the park boundary. When the Bureau of Land Management undertakes a management plan for land it administers along the river downstream of the park, the National Park Service will work with the BLM as appropriate during their planning process.

Recreational Use

Commercial use of the riparian areas would continue, with the following provisions:

Scenic Floating

Each individual scenic float operation will retain its current permitted daily launch quota, not to exceed a monthly cap. This monthly cap will be based on each concessionaire's highest month over the

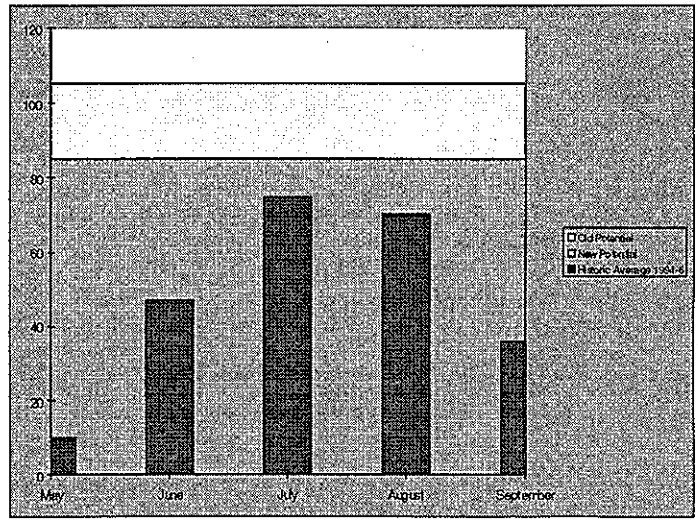
1994, 1995 and 1996 operating seasons. By utilizing each concessionaire's historic high month, current use of reserve allotments will be factored into the monthly use limit.

However, in order to give the concessionaire's additional flexibility to address unusual high use days, the reserve allotment system will remain, based on the following system. Historic use of reserve allotments over the last three operating seasons will be factored into individual permits. As with the monthly allotments, each company's reserve will be based on its highest monthly reserve use. Each company's reserve may be used to exceed its daily permitted launch quota; however, it will count towards the month cap since these number's were factored into the monthly use limit.

Individual permits will be assigned through the concessions program; individual launch numbers will be allocated through the concessions operating plan for each individual outfitter. The intent is to give each concessionaire some flexibility to take into account weather and client patterns. Each current permittee with no use will retain its daily allotment, and its monthly cap will be based on the lowest of all float trip operators. In 1999, when the new commercial prospectuses are issued, each permitee who has not utilized its permit two out of the last three years will find its use subject to reallocation.

The monthly overall cap for commercial scenic use will be 2,603 launches, which will include 43 reserve allotments. This provides a potential average of 84 launches per day, but in reality, all days are not amenable to the same degree of river use. Therefore, total daily scenic launches permitted would remain at 103 per day, more than the average, to allow flexibility for fluctuations in weather, water, clients numbers, etc. This limit on the commercial outfitters will reduce current permitted levels by approximately 23%, but current use levels will easily be accommodated. This is a 10% increase over July 1996 levels. **In other words, existing use will not be reduced, but the potential for significant growth has been eliminated.**

For example: If a concessionaire has a monthly not to exceed (NTE) of 500 launches, with a daily NTE of 20, he may launch an average of about 16 boats a day. Actual weather and customer patterns suggest that use will vary, and he may launch up to 20 boats a day as long as at the end of the month he has not exceeded 500 launches.



The above graph shows the historical average use in relation to both the old limits and the new proposal. Previously, limits were only in effect from June 10 through Sept. 15. This plan proposes that limits be in effect year round.

Guided Fishing

In commercial guided fishing, as in scenic floating, **the intent is to easily accommodate current levels of use, but eliminate the potential for significant growth.** Guided fishing launches over the last three seasons have averaged 13/ day, never exceeding 19 launches/day. The goal is to have no more than 20 guided fishing launches on any given day between Jackson Lake Dam and Moose.

Each fishing outfitter will be assigned a monthly cap, based on its highest month over the 1994, 1995 and 1996 operating seasons. Those fishing outfitters with little use over the last three seasons will be assigned a monthly cap based on the lowest of all current fishing outfitters. This will provide a monthly overall total of 526 commercial fishing launches, a potential average of 17 launches/day. As in scenic float operations, all days are not amenable to the same degree of fishing use, and we anticipate that actual use will fluctuate. In 1999, when the new commercial prospectuses are issued, those permitees who have not utilized their permits two out of the last three years, will find their permitted use subject to reallocation.

Each guide service will be limited to six launches per day. As in the current concessions operating plan, guided fishing operations will phone in their use numbers and locations to park dispatch each morning. Dispatch will provide the locations of other guides, so that fishing operations can spread themselves out voluntarily through the other sections. If the standard of 20 launches per day is exceeded more than 5 days a month, a more restrictive daily cap will also be placed on each outfit.

In order to spread use out from the crowded river sections, the following incentive will be provided to float the Moose/Wilson section. On this section, fishing guides will be allowed to float 3 launches per day that will be applied to their daily cap, but not to their monthly cap. The goal, as in the upriver sections, will be to have no more than 20 launches per day on the Moose/Wilson section. If this is exceeded more than 5 days a month, than a more restrictive cap will be explored.

Current rules applicable to guided fishing and float trips concerning designated launching, landing and lunch stop sites will continue. Stopping commercial scenic boats other than at designated locations along the river will be prohibited. Other administrative or operational requirements to remain in effect include monthly reporting of operations, boatman qualifications, equipment standards, provision of an interpretive program to the public, safety requirements and Park Service approval of prices. These will continue to be addressed and modified, if necessary, through annual concession operating plans.

Existing picnic sites will continue to be available to both private users and designated commercial users, if conditions permit and no new resource implications arise. No special maintenance will be conducted, such as grading roads to keep these sites open to vehicles.

Commercial boats will continue to wait to launch until others are out of sight; this regulation has been in effect for some time. If excessive crowding becomes an issue, on the ramps or on the river, designated launch times may be instituted.

Commercial rafts will be limited to craft's which are rated to carry 17 passengers or less, with the exception of Jackson Lake Lodge's big boats, which are rated to carry up to 24 passengers.

In 1999 when the commercial prospectuses are issued, the number of rafts per group may be further limited and certain shuttle frequencies may be required.

The following passenger meeting points will be designated: Moose, Pacific Creek, and concession operated sites. However, commercial operators will be encouraged to meet clients at their own facilities. If crowding at parking areas becomes a problem in the future, commercial operators may be required to meet clients off site.

The launch site at Triangle X will continue to be utilized by the ranch.

Private Floating

Non-commercial use will continue with the following provisions:

A monitoring system was developed and began the summer of 1997 to obtain accurate counts of private users. If non-commercial use exceeds standards outlined in chapter 5, the number of private boaters allowed on the river per day will be limited through the implementation of a permit system. If use levels do not significantly increase, no restrictions are anticipated.

Launch Areas

The NPS will conduct minor dredging at launch sites. Gravel removal will be conducted to provide reasonable access to the visitor when necessary. Dredging will be conducted only in the immediate vicinity of the launch areas, and only when deemed necessary by park managers.

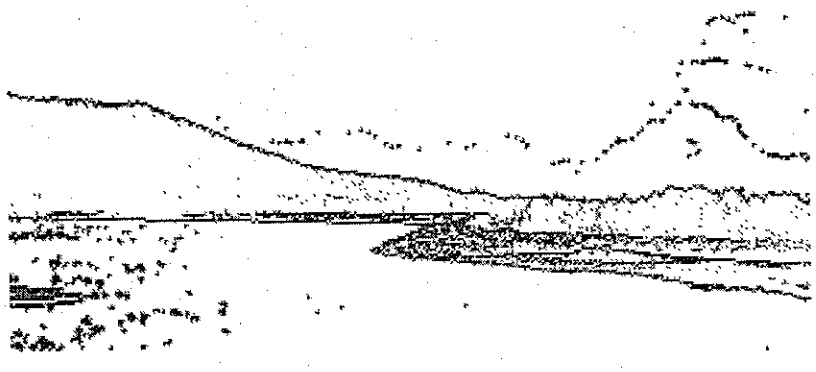
Discussions of the launch areas are conceptual in this plan. Site specific design work will be completed prior to construction.

Jackson Lake Dam

The NPS will adopt the conceptual design developed during the 1980s, when the Jackson Lake Dam was reconstructed. At that time, the area now used for parking and boat launching was the construction staging area. A schematic site plan was developed to rehabilitate much of the disturbed area while providing access to the river. The plan's intent is still valid. Pedestrian access to the river will be provided for a variety of uses including fishing, walking, picnicking or just sitting and enjoying the environment. Parking for vehicles will be provided just north of the river, in an area which has trees for shade and provides some separation from the river bank. A walkway will be built to provide easy access from the parking lot to the river. In addition, access, but no developed slip, will be provided for the loading and unloading of small boats. Limited handicapped parking will be provided as well.

Cattlemans Bridge

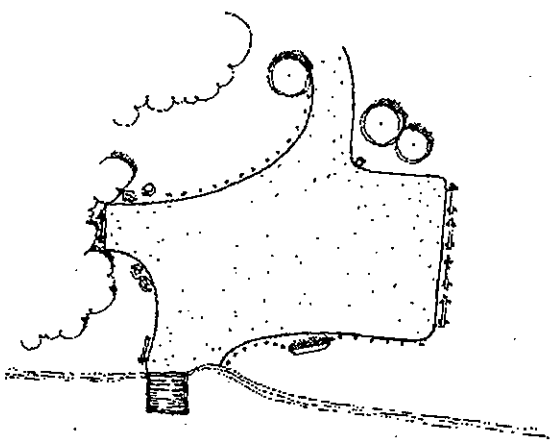
A survey and evaluation will be initiated to determine the historic significance of the bridge prior to any action taken in this area.



Depending on the outcome of that survey, the following is proposed:

Launch/Parking: This plan proposes to maintain the primitive environment at Cattlemans Bridge but develop an accessible launch site for those wishing to explore the Oxbow area. Development at the site will be kept to a minimum. The topography provides easy access to the river with minimal environmental effect; this site is appropriate for all types of users because they can launch and return to the same spot, as well as float a quiet section of river. Configuration and use of Cattlemans Bridge launch will continue as it exists currently. Minor changes will include delineation of circulation and parking with rock, wood bollards and barrier logs. The approach to the river access will be changed to allow easier backing. Areas not necessary for circulation and parking will be revegetated.

Bridge: The bridge poses a serious safety hazard. Depending on the outcome of the survey and evaluation, the bridge will either be removed or stabilized.



Pacific Creek

The Pacific Creek launch site will be stabilized.

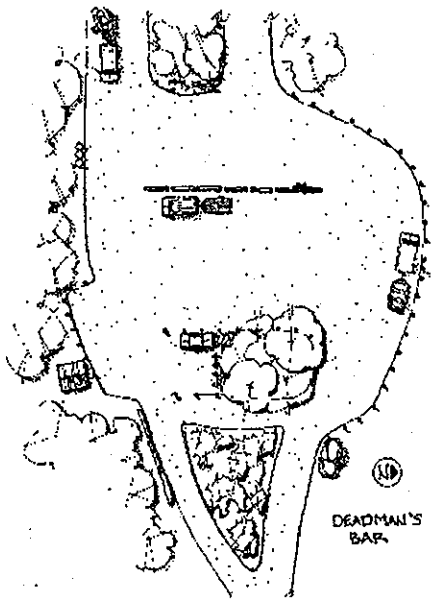
The boat launch is in an eroding section of the Snake River just downstream of the Jackson Lake Dam. The streambank material is highly susceptible to erosion because it is small (sand- to silt-sized) and noncohesive. The launch is located in an outside bend along a small channel, separated from the main channel by a small island. The outside bend location increases water velocities which remove the erodible streambank material. Water has undercut the bank so severely that the launch has become unstable and difficult to use.

The park service proposes to armor the bank with riprap. This should slow erosion of material. This will also help stabilize the launch area in its current location. Additionally, a unisex restroom will be constructed to replace the existing port-o-john, and the parking area will be striped to better define parking.

Deadmans Bar

Deadmans Bar will be slightly changed to accommodate use patterns. Bollards and horizontal logs will provide better delineation of the parking area. In addition, the approach on the north end of the parking lot will be expanded slightly to accommodate temporary van and trailer parking for those waiting to access the launch ramps. The parking area will be redesigned to provide designated spaces and separation between commercial and private users.

Also, an additional double unisex restroom will be constructed.



Schwabachers Landing

Schwabachers Landing will be remain as is. The parking area will be better delineated with vertical logs and placed boulders. The existing pit toilet will be relocated to the upper bench to prevent its' loss in another high water event, and to make it more accessible.

Moose Landing

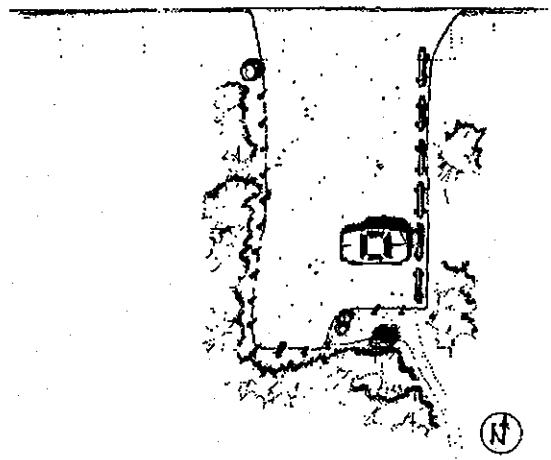
No changes in the Moose landing and parking area are proposed.

RKO Landing

Minor improvements to the RKO landing road will be made to reduce the number of deep potholes in the roadbed. Minor improvements will be made to eliminate potholes in the parking area. No increase in current use is proposed and no commercial use of this site will be permitted.

Worm Hole

The Worm Hole parking area will be widened slightly to allow head-in parking on the eastern edge of the lot. Parking will be delineated by horizontal log parking blocks, and the lot will be delineated by a combination of vertical log bollards and placed boulders. A "hammerhead" backing area will be added to assist in pulling out of the parking spaces. No commercial use of this site will be permitted.



Natural Resources

- Existing closures will remain in effect to protect wintering and nesting wildlife and spawning fish. Efforts to monitor activities for nesting eagles, herons, osprey, trumpeter swans, raptors, and amphibians will continue at present levels.

- Water levels in the river will be managed as they are now.

- Use of the riparian area by horses and other livestock will be subject to the restrictions stated within other park documents, such as the Natural Resources Management Plan and the Grazing Management Plan.

- Concession companies will be required to bear-proof all lunch stop sites and educate all float trip employees about securing objects that would attract a bear, in the ways described in the Human/Bear Management Plan.

- A system will be developed and implemented to monitor effects of visitor use on vegetation. A revegetation plan will be developed to mitigate any changes to vegetation from visitor use. Trails at the launch areas will be clearly defined to eliminate use of undesignated trails.

- Grand Teton National Park will continue to work with the Bureau of Reclamation on the Minimum Stream Flow Study now underway to understand and mitigate the dam's effect on water flows as it relates to recreation, hydrologic process, fisheries and water quality.

- The water quality monitoring program will be continued.

- A research and monitoring program will be developed to gather information on river otter population and how visitors effect that population.

- A research and monitoring program will be developed to determine how lack of flushing flows, due to the dam, affect cottonwood communities.

- A research and monitoring program will be developed to fully evaluate the long term effects of dredging at the launch areas.

Operational Issues

If funding permits, NPS will staff launch sites during busy times.

Additional educational and interpretive signage will be provided at the launch sites.

PART FIVE,
INDICATORS, STANDARDS & MONITORING

PART FIVE: INDICATORS, STANDARDS AND MONITORING

This section of the plan discusses the concept of carrying capacity, describes what measures will be used to ensure that river conditions remain in compliance with the desired future conditions and what methods will be used to monitor conditions on the river. In addition, this section outlines future research needs as they relate to the river corridor. The indicators and standards presented here are preliminary, will be field tested further during the summer of 1997, and revised as necessary. It is the goal of this plan to identify indicators and standards that will ensure that desired future conditions are met. Due to staffing and funding constraints, these measures need to be easily monitored as well as adequate indicators of overall river conditions.

Carrying Capacity

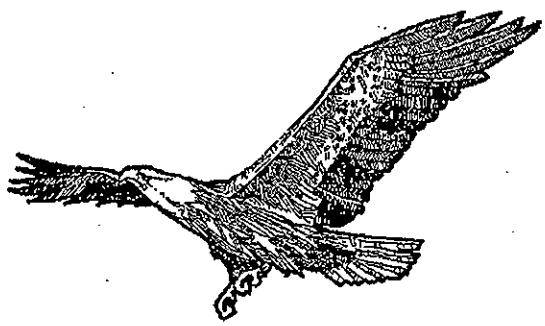
In the past, the question of how much public use is appropriate in a national park has been framed in terms of visitor "carrying capacity." The Park Service is required by law to address carrying capacity in planning for parks: the 1978 National Parks and Recreation Act (P.L. 95-625) requires each park to include "identification of and implementation commitments for visitor carrying capacities for all areas of the unit." (Arches VERP Plan, 1995).

For the purposes of this plan, carrying capacity is defined as "the type and level of visitor use that can be accommodated while sustaining the desired resource and social conditions that complement the purposes of the park unit and its management objectives."

In other words, for the purposes of this plan, carrying capacity is interpreted not as a prescription for numbers of people, but as a prescription for numbers of people appropriate for desired ecological and social conditions. Measures of appropriate conditions replace measures of maximum sustainable use often used in relation to other types of carrying capacities (e.g. range capacity for domestic ungulates of wildlife habitat) (VERP, 1995).

A major premise of this planning process is that desired conditions, which are qualitative in nature, must be translated into objective measurements through the use of indicators and standards. It is important to remember that standards do not represent goals or desired conditions. Standards represent the trigger points that define when conditions become unacceptable.

When indicators show that visitor experience and resource conditions do not meet these standards, management actions will be taken to restore acceptable conditions.



Social Indicators and Standards

Indicator:	The number and frequency of boats encountered on the river.
Standard:	Seeing five or more other private scenic boats while floating the river 50% of the time.
Action:	Permit system will be developed for private users, better scheduling spacing of launch times. Institute the practice of not launching till previous boat is out of view for private users.

Indicator:	Congestion at parking areas and launch ramps; time spent waiting to launch.
Standard:	80% of the parties will have to wait longer than 15 minutes 8 days per month.
Action:	Staff launch sites, schedule staggered launch times.

Resource Indicators and standards

Indicator:	Occupancy and productivity of bald eagle nests.
Standard:	No downward trend in productivity over a five year running average. No downward trend in activity, as defined by territory occupancy or breeding attempts, at nest sites over a three year running average. Maintain consistent productivity at individual nest sites that are historically reliable or consistent (i.e. Schwabachers, Oxbow) over a two year period. (This means no consecutive years of non-productivity at these nest sites).
Action:	Identify problem and initiate solution if possible. May initiate time restraints to keep visitors from floating through nest areas in the early morning and evenings. May also implement new closures to restrict people from disembarking from rafts or fishing boats near critical areas. May also monitor for contaminants such as DDT derivatives in egg shell fragments or in the aquatic environment.

Indicator:	Occupancy and productivity of Great Blue Heron rookeries.
Standard:	No downward trend in overall productivity of the rookery over a five year running average. No downward trend in breeding activity, as defined by rookery occupancy and overall productivity, at rookeries over a three year running average. No decrease in occupancy at individual rookeries that are historically reliable or consistent over a two year period. (This means no consecutive years of non-occupancy).
Action:	Identify problem and initiate solution if possible. May develop time restraints to keep visitors away from floating near rookeries in the early morning and evenings. May also implement new closures to restrict people from disembarking from rafts or fishing boats at critical areas. May also monitor for contaminants such as DDT derivatives in egg shell fragments or in the aquatic environment.

note: bald eagles and great blue herons were chosen as a primary resource indicator for the following reasons:

- They are at the top of the food chain.
- Ongoing monitoring efforts and good historical data exists to monitor trends.
- They are sensitive to human disturbance.
- They are a good indicator of the relative health of the fishery.

Monitoring

Continued monitoring will be necessary in order to determine if river conditions are consistent with the desired future conditions outlined in the plan. Listed below are actions that will be accomplished on a yearly basis following completion of this plan:

Bald Eagle Monitoring

Known bald eagle territories will continue to be monitored on a biweekly basis from late March to mid-June when young are from 5-7 weeks old. All young within Grand Teton NP will continue to be banded with aluminum color-coded and USFWS bands by Park biologists. Periodically, new areas will be surveyed for bald eagle occupancy, and reports of new activity investigated. Trends over time in occupancy and productivity will be monitored.

Vegetation Monitoring

Periodic monitoring of the river access areas will be conducted to determine if excessive trampling is occurring and social trails are forming. If this is the case, then measures such as formalizing trails, fencing and revegetation efforts will be considered.

Water Quality

There has been an ongoing water quality monitoring effort by the National Water

Quality Assessment Program. This program monitors for phosphorus levels, total nitrates, turbidity, summer water temperatures and contaminants.

Concessions Operations

Concessions operations will be evaluated annually to insure that the public is provided with satisfactory service and that management objectives are met.

River Use

All aspects of river use including commercial operations, private use, shoreline fishing and hiking will be monitored to insure that the desired future conditions, indicators and standards are not violated.

Snake River Management Plan

In order for the river management program to be effective and responsive to change, there will be an ongoing effort to identify, evaluate and correct problems and deficiencies. As new information becomes available through the monitoring process and future research, the River Management Plan may be modified. Policies found to be inconsistent with the protection of natural and cultural resources will be revised as needed. Changes that affect use allocations will not be implemented without allowing time for public review and input and for concessionaires to adjust their operations. To assure that the River Management Plan remains a functional document, it will be reviewed annually by staff involved in river operations.

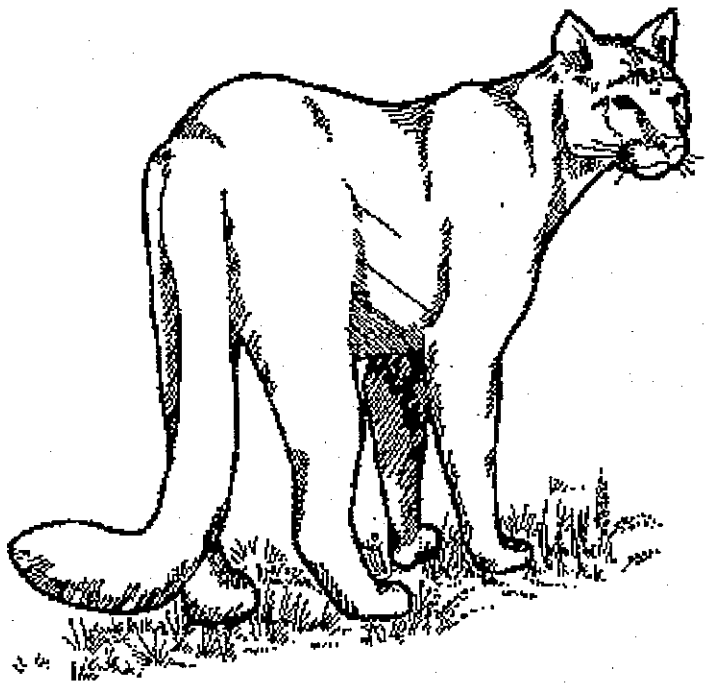
Research Needs

As a result of this study, the following future research needs were identified as necessary to better understand both the river system and how visitor use impacts natural resources:

Improve the understanding of how recreation activities affect wildlife, and how this activity is connected to populations and communities.

Develop a specific study to gather information on the river otter population and how visitors affect that population.

Determine how lack of flushing flows due to the dam affect cottonwood communities.



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Printing costs for this document funded by a donation from the One-Fly Foundation

Printed on recycled paper